CHNOLOGY DEPT.

DECEMBER, 1945

# Industrial FINISHING

DEC 31 1945

Published Monthly in the Interest of Product Cleaning and Painting

t, and on earth PEACE, good will toward men.

ADVANCE PAINT COMPANY, Indianapolis, Ind.

Manufacturers of Finishing Materials

# FROM SPRAY GUN TO DECAL*... Just 1 Hour

With Roxaprene speed enamel there will be new concepts of production time—and costs—in tractor plants. The use of this quicker drying finish is the equivalent of doubling or tripling your present facilities.

Roxaprene is a one coat system that provides speed without sacrificing excellent outdoor durability. What's more, it has good resistance to battery acids, farm chemicals and alkalis.

But what is probably more important is the versatility of Roxaprene. Do you know of any other single finishing material that

1. May be applied by dip and roller coat as well as by spray?
2. Air dries out of dust practically as fast as lacquer..or
3. Force dries in 15 to 20 minutes at 160 to 180°..or
4. Bakes fast in infra red..or
5. Heat cures at 250° in just a few minutes?
6. And no matter how applied or dried, results in the same rich, even gloss?

Why not find out whether Roxaprene can be a short cut to lower costs and higher production rates in your plant? Let's exchange ideas. Write department 45L

**ROXAPRENE IS 3 WAYS BETTER**

- One Coat Economy — Speed
- Long Life — High Durability
- Versatility of Application

*In tractor production Roxaprene has been found to cut 3 hours from regular finishing time.

ROXALIN Flexible FINISHES
INCORPORATED
ELIZABETH, N. J. • NEW JERSEY

# ORGANIC FINISHES

for •ZINC •ALUMINUM •COPPER AND THEIR ALLOYS

by Non-Electrical Chemical Treatment

**ALUMOX** *(Patent Pending.)* A simple dip process for passivating aluminum alloys to give a toothy, corrosion inhibiting, pleasing grey-green surface that bonds the enamel to aluminum. High salt spray protection. Low cost application.

**EBONOL-C** *(U. S. Patent 2,364,993.)* A short process operating at 210°F which oxidizes copper, brass and other copper alloys to form adherent, black cupric oxide. A nap-like surface is created having amazing adsorptive power giving extremely high adhesion of lacquers, enamels and paints. The oxide also protects copper and brass from weather and corrosive atmospheres.

**EBONOL-Z** This process forms on Zinc and Zinc Alloys by chemical means in a few minutes an adherent, inert oxide to which organic finishes avidly cling. It is also a beautiful black finish in itself.

*Sample parts processed or trial samples furnished free.*

THE ENTHONE COMPANY

148 ELM STREET.

NEW HAVEN 2. CONN.

# THE RIGHT EXTENSION FOR EVERY S

Here are eight extensions which add *reach* to your spray guns . . . which make it possible for you to do a first class spraying job in hard-to-get-at spots. No matter how awkward the place is, there is a good chance that there is a Binks extension which will reach it quickly and easily.

Bink
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19
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such

**MODEL EAX**

Sprays distant surfaces out of reach of ordinary guns. Will spray all standard products. Diameter of extension head ⅜".

**MODEL ERX**

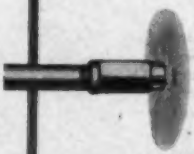
For reverse spraying. Will spray all standard products. Fixed head. Diameter of extension head 1 ⅜".

**MODEL EA***

Long reach with spray pattern adjustable from round to flat. External and internal atomizing. Diameter of head 1 ¾".

**MODEL C**

360° circular spray from groove at end of the extension. For inside of pipes, barrels, etc. Diameter of extension head 1".



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**SEND TODAY**
**for your free copy of Binks catalog-data book.**

BINKS MA

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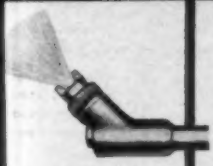
Pittsburgh • St. Louis • Milwaukee Boston

# SPRAY JOB!

Binks extensions are available in lengths from 6 in. to 7 ft. Those starred (*) can be equipped with all pressure nozzle set-ups used on Binks Model 19 spray gun. Model EA available with tungsten carbon inserts for spraying abrasive materials such as those used in the porcelain enamel field.



**MODEL ENX**

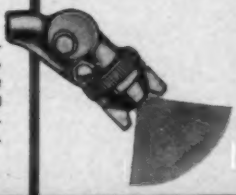
Fits through small opening and sprays at 45° angle. Head may be swiveled in any direction. Diameter of head 1 ¾".

**MODEL EBX**

Fits through small opening and sprays at 90° angle. Head may be swiveled in any direction. Diameter of head 1 ⅜".

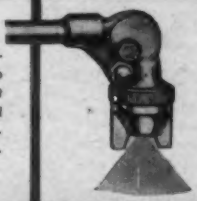
**MODEL EN***

Adjustable spray pattern from round to flat. Swivel head at 45° angle. External and internal atomizing. Diameter of extension head 2 ½".



**MODEL EB***

Spray pattern adjustable from round to flat. Swivel head at 90° angle. External and internal atomizing. Diameter of extension head 3".



## MANUFACTURING COMPANY

New York • Detroit • San Francisco • Philadelphia • Cleveland
Boston • Los Angeles • Seattle • Windsor, Ontario, Canada

To be sure of the best in Spray Painting and Finishing Equipment, remember to ask for BINKS.

# Perm-A-Clor for ALUMINUM CLEANING by VAPOR DEGREASING

*Photograph courtesy of Curtiss-Wright Corporation, Propeller Division*

● Day after day, through peak periods of aircraft production, tons of aluminum sheet and die castings have been prepared for further processing or inspection by vapor degreasing. PERM-A-CLOR is the solvent selected for this critical job due to its ability to stand up under all high-production conditions and varieties of metals.

Stability of solvent in a degreaser means staying ability when the cleaning operations are toughest. For vapor-degreasing of aluminum, magnesium or combinations of metals —where the utmost in solvent stability is essential — specify PERM-A-CLOR.

DETREX vapor-degreasing solvents, TRIAD and PERM-A-CLOR, are stocked in all industrial areas in the United States. There's a Detrex representative in your locality.

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**DETREX Corporation**

DETROIT 27 • MICHIGAN

Solvent Degreasers • Metal Parts Washers • Processing Equipment • Industrial Cleaning Chemicals

TWENTY-SECOND YEAR OF PUBLICATION

# Industrial FINISHING

W. H. ROHR, Editor  P. C. BARDIN, Associate Editor

Vol. XXII, No. 2  DECEMBER, 1945  $2.00 a Year

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**Unlimited Horizons** — According to Leo Cherne, brilliant young Executive Secretary of the Research Institute of America, the U. S. A. "has not even scratched its expansion potential." However, he believes that we are at a crucial crossroads, with the choice ahead being either a vastly higher standard of living, or a sadly lower one.

"No power on earth," he further believes, "can stop the forces that are acting to raise our cost of living." The basic forces now working on prices, Cherne insists, have a steadily upward tendency. He considers labor one of the least flexible of all factors, and points out that any downward wage revision is highly unlikely at this time.

* * *

**Abundant Uranium** — It will be virtually impossible to prevent a number of nations from obtaining uranium, declares the authoritative *Engineering and Mining Journal*, unless the United States can secure their voluntary compliance, or sets out to police their internal activities.

This publication emphasizes the fact that uranium is obtainable from such common sources as coal, bitumin and oil shales. "It is conservative to state," concludes this thoughtful analysis, "that the world's ultimate recoverable reserves from deposits of the type that have been commercial in the past will exceed 10,000 tons of uranium content."

* * *

**Television for Engines**—A noteworthy application of television in locating engine ignition faults is reported by *Aviation News*. By use of an ingenious apparatus, the ignition performance is thrown pictorially on a screen while the engine is running. The picture projects a row of peaked figures—one for each spark plug—arranged in the firing order of the engine. A steady row of identical figures indicates perfect operation, but an irregular pattern means trouble.

* * *

**Color Aids Sales** — Many vivid lessons learned in wartime on the use of color will soon be applied by American business. It is predicted that our daily newspapers will be running display advertisements in two or more colors. A recent survey among home furnishings dealers showed that three out of four believe that color influences customers more than design. And tinted walls, floors and machinery are becoming commonplace in modern factories to create environment conditions that permit workers to do their jobs more easily.

* * *

**Mechanical Core** — A dramatic innovation in household appliances has been unveiled by the Ingersoll Division of the Borg-Warner Corp. It incorporates in a single "mechanical core" facilities for household heating, plumbing, electrical, bath, kitchen and laundry elements.

This revolutionary mechanism is already approaching assembly-line production. It is pointed out that the unit is adaptable to both prefabricated and conventionally designed houses. Borg-Warner is

*(Continued on page 9)*

SURFASEAL
SURFASEAL
**SURFASEAL**

*Definitely Different · Positively Perfected*

*Seals Wood Surfaces*

This startling new development is a UNIVERSAL sealer for use under Lacquers, Synthetics or Varnishes. It gives greatly improved mar-resistance, provides better adhesion, improves "build"—and we guarantee that it will materially improve your finish!

The TOUGHEST—MOST MAR-PROOF finish you've ever tried. Order 5 Gals. at Drum Price with our GUARANTEE.

**V. J. DOLAN & COMPANY, Inc.**

Manufacturers of "Unquestionable Quality" INDUSTRIAL FINISHES.
Lacquers · Sealers · Synthetics · Stains · Fillers · Thinners

**1838 N. Laramie Ave. Berkshire 0100 Chicago 39, Ill.**

**TORNADO**
*settles your*
**DUST**
*problem*

NOTHING means the "finish" of dust—except regular cleaning with the TORNADO which gets rid of it with its powerful suction, large capacity and easy portability. Quickly picks up dust, dirt, flux, etc.

Equipped with attachments for cleaning everything — floors, walls, ceilings, overhead pipes, work tables, etc.—TORNADO makes quick work of clean-ups. Take it to the job!

Write for details and FREE TRIAL Offer

**TORNADO**

**BREUER ELECTRIC MFG. CO.**
5094 N. Ravenswood Ave., Chicago 40

# THE DIFFERENCE IS *CLEAR!*

## PERFECTION FLAT FINISH Free From All Distortion . . . Transparent As Clear Glass

● Just as PERFECTION FLAT FINISH shows the beautiful girl in all her loveliness, so does it reveal the full beauty of wood grain and stain when applied to furniture.

PERFECTION is as unlike other flat finishes as day and night. Unique product of synthetic chemistry, it contains no beauty-masking stearates or other flattening agents. That's why PERFECTION is *always perfectly clear, always free from distortion*—why it adds dollars to the value of your products.

For convincing proof, try PERFECTION in your own plant. Fast drying, water-proof, liquor-proof—free from orange peel—PERFECTION FLAT FINISH is available in a full range of beautiful and durable sheens.

**PERFECTION**
**PAINT & COLOR COMPANY**
Indianapolis, Indiana

attempting to apply to the housing field lessons learned in the mass production of automobiles. The company aims to make modern conveniences available at a dramatically low price to that section of the population now living on a substandard basis. Spokesmen assert the new unit could be built into houses costing as little as $3000.

* * *

**Warning on Design**—Too radical a change in the design of a product may prove a serious handicap in selling, warns William O'Neil, the industrial engineer. Old patterns will not suffice, he adds, but improvement must be progressively evolutionary.

O'Neil declares that the design of a product should be so fundamental that changing tastes will not outmode it and necessitate retooling again in six months. Merchandise should not have a cheap, repellent appearance; on the other hand, he cautions, a product should not be so *beautiful* that the average customer will be afraid to buy it!

* * *

**Hard-Headed Advice**—Over-pricing is a dangerous policy which may pave the way to untold future trouble, insists John J. Nance, vice-president of the Zenith Radio Corp. He points out that the great buyers' strike of 1921 was caused by a fantastic price structure.

The "Achilles heel" of industry is its inability to create sustained demand for merchandise, particularly durable consumer goods which must pace the entire business activity of the nation to new highs. "There is no question in my mind," declares Nance, "but that industry is on trial today as it never has been before."

This topflight sales executive is inclined to discount the pent-up

SPRUANCE

*for*

Wood and Metal Finishes

STAINS
FILLERS
SEALERS
LACQUERS
VARNISHES
SYNTHETICS

We are now supplying the furniture trade with 4-hour drying fillers. Let us help solve your finishing problem TODAY.

THE GILBERT SPRUANCE CO.

RICHMOND & TIOGA STS.

PHILADELPHIA, PA.

# SAFEGUARD YOUR SPRAY BOOTHS

**Apply Wyandotte Spray Booth Coating *first* for quicker removal later of layers of inflammable paint. It takes only a thin coating to make cleaning easier, speedier, more economical. Write Wyandotte Chemicals Corporation, J. B. Ford Division, Wyandotte, Michigan, for full details!**

**Wyandotte F-100* will help cut your floor-cleaning costs. Even heavy soil disappears when this remarkable compound gets to work!**

***Registered Trade Mark**

Remove..PRODUCTION
LINE DUST · LINT and
SAND PARTICLES
MAKE YOUR FINISH
TACK OFF THOSE SPECKS
SPARKLE
Crystal
TACK RAG
Speed Up Your FINISHING PRODUCTION LINE with this Soft Tacky Cloth
BCP
TACKY WIPERS
Available in GROSS LOTS thru PAINT DEALERS or from the Processor
Exclusively Processed by
BAUGHN CHEMICAL PRODUCTS CO.
1303 West Chicago Avenue • • • • • Chicago 22, U. S. A.


"urgent, pressing" demand by consumers as a mere fraction of what the theorists have predicted. Furthermore, he asserts that sales-minded management must hold up national income and consumer expenditures "to levels that come at least close to those of wartime boom years."

* * *

**Big Market Waiting**—As an example of the potential demand for electronic air-filtration equipment, one authority declares that more than two million dollars worth of such installations can be expected in the New York City area alone during the next 18 months. The forecast is offered by J. F. Reed, vice-president of the American Air Filter Co., of Louisville, Ky.

This equipment causes particles of dust, soot, smoke, dirt and industrial oil fumes to be electronically charged and attracted to a collecting element. Among the major plants which have purchased such devices are factories belonging to General Motors, Chrysler, Ford and Sperry Gyroscope. In addition, an enormous export market is opening up, with the Soviet Union and France expressing particularly keen interest.

* * *

**Paint That Glows** — Waldemar Kaempffert, science editor of the New York *Times*, offers an interesting report on Russian applications of luminous paint for the walls, ceiling and floors of hospital operating rooms. In addition to eliminating shadows cast by the surgeons's hands and instruments, the danger from sudden failure of power is reduced.

The luminescent paint is made by mixing small quantities of zinc or cadmium sulphide with ordinary pigments. A mercury vapor lamp,

*(Continued on page 108)*

# *Learn the* LOW COST *of*
## *Controlled Humidity*
## FORCED DRYING

### CUT YOUR COST-PER-FINISHED-PIECE

You'll save material and man-hours . . . and the upkeep of your KOCH Forced Drying System will be astoundingly low.

### INCREASE YOUR PROFITS

Production will go up . . . and the use of KOCH Controlled Humidity Forced Drying Equipment practically banishes rejects.

### STRENGTHEN YOUR COMPETITIVE POSITION

Results are always uniform . . . and buyers will be impressed by the dependable, high quality of your product's finish.

Prepare NOW to meet the demands for increased production and improved quality. Contact KOCH for information about their CONTROLLED HUMIDITY FORCED DRYING EQUIPMENT.

GET FACTS WITHOUT OBLIGATION

GEORGE KOCH SONS, INC.
INDUSTRIAL EQUIPMENT
EVANSVILLE 4 INDIANA

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Let

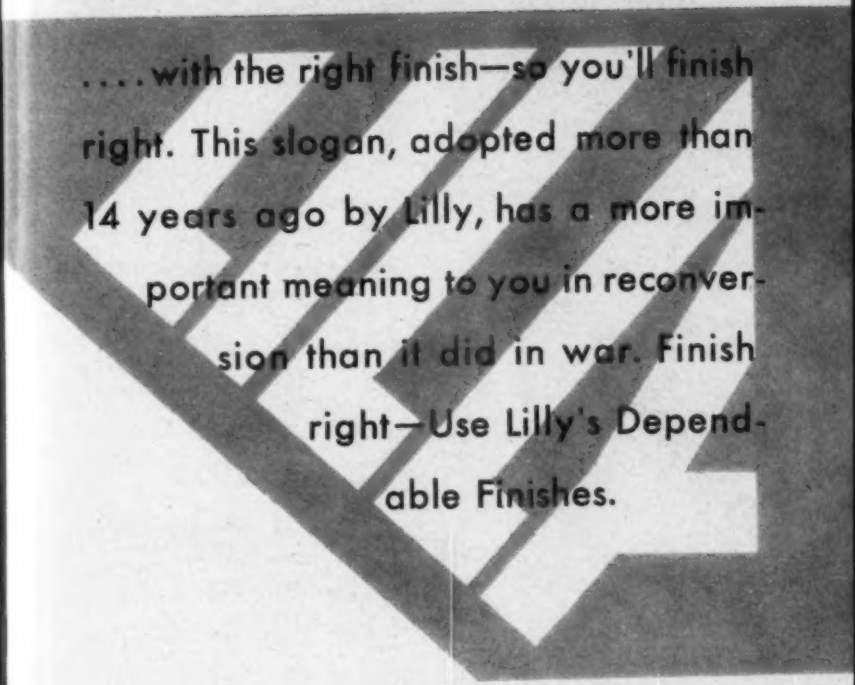
Lilly

"With the right Finish—
You'll finish right"

THE LILLY COMPANY

HIGH POINT, N. C.

# *Lilly load your reconversion guns...*



....with the right finish—so you'll finish right. This slogan, adopted more than 14 years ago by Lilly, has a more important meaning to you in reconversion than it did in war. Finish right—Use Lilly's Dependable Finishes.

**LILLY VARNISH COMPANY**

INDIANAPOLIS, IND.

# Do you know...?

**Q.** Soon, people in cars will talk to distant points by:

☐ Telephone ☐ Dictaphone ☐ Two-way radio

**A.** Two-way radio. Wartime experience gained in building two-way communication equipment has proved that it can be compact, inexpensive, and highly efficient. In making radio equipment of all kinds, Permacel paper masking tape is widely used—to mask surfaces during painting, ensuring clear-cut color separations and good electrical contacts at masked sections—to mark off instrument panels—to protect plastic parts during chemical baths.

No. 23 in a series

**Q.** Planes can fly when ceiling and visibility are zero by:

☐ Radio ☐ Radar ☐ Television

**A.** Radar will make private flying safer. In making small planes, pressure-sensitive tapes help speed production. One of many uses of Permacel high-temperature tape is protecting wood propellers from hot flux when soldering screws into metal edges.

**Q.** The title of this booklet refers to:

☐ Electricity ☐ Tape
☐ New-type wrench

**A.** Pressure-sensitive tape. This free booklet shows how Permacel Industrial Tapes save time, cut costs. Gives many new uses for tapes to help you solve production problems. Write for free copy. Dept. IF-23, Industrial Tape Corp., New Brunswick, N. J.

**Q.** Stoves are usually sealed prior to shipment in order to:

☐ Protect parts ☐ Keep moisture out
☐ Identify models

**A.** Protect parts. Permacel cloth tape holds burners and grates in place, prevents doors from opening, keeps trays from rattling. Permacel paper masking tape is also used for two-tone painting.

**IMPORTANT:** *Our research laboratories are at your disposal for development of special tapes to meet special needs.*

**Permacel Industrial Tapes**

**INDUSTRIAL TAPE CORPORATION**

*New Brunswick, N. J.*

"PERMACEL" REG. U. S. PAT. OFF.

WALKER *protective and decorative coatings check Okeh....*

✓ *primers*
✓ *surfacers*
✓ *lacquers*
✓ *synthetics*
✓ *special coatings*
✓ *wrinkles*

● **WHETHER you make refrigerators, washing machines, stoves, ranges, radios, furniture, toys, novelties, or the thousand and one items required to satisfy consumer needs . . . Walker protective and decorative coatings will provide just the finish desired. They have eye appeal, durability and ease of application.**

*"Call on Walker"*

H. V. WALKER CO.
Elizabeth, New Jersey
MODERN PRODUCTION FINISHES

# AN INSTRUCTIVE BROCHURE ON INFRA-RED

*and it's* **YOURS**

**IT TELLS THE COMPLETE STORY AND SHOWS BEAUTIFUL INSTALLATIONS OF INFRA-RED**

•

**PENETRAY**
TRADE MARK

**WILL SEND IT TO YOU—FREE**

PENETRAY CORPORATION
TOLEDO 5, OHIO

# LACQUERS
# SEALERS
## ENAMELS
## UNDERCOATS
## STAINS • GLAZES
## SHELLAC
## NOVELTY FINISHES

•

IN STEP WITH THE TIMES

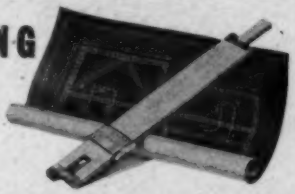
*Industrial Finishes*

*that make the most of available raw materials to give you greatest durability, together with attractive appearance and economy.*

• FOR APPLICATION BY ALL METHODS

JAMES B. DAY & CO., CHICAGO

# OVEN ENGINEERING NEWS



## Standard Box Ovens Provide High Speed, Top Efficiency For Simpler Heating Jobs

For simpler heating applications not requiring elaborate handling, conveying or heating equipment, box-type ovens such as these can often be used to advantage. The Industrial Oven Engineering Company designs and manufactures a complete line of such ovens.

***Below:*** Standard type dehydrogenizing oven for various widths and gages of cold rolled steel strip; this unit cuts heating time 50%.

This 900° oven for heat treating aluminum forgings has a built-in high-pressure air heater for positive and rapid circulation through a relatively dense work load. The oven is shipped assembled, requiring no post-delivery assembly except attachment of accessories.

***Right Above:*** Designed for baking synthetic finishes on storage cabinets, this oven cuts baking time 15%.

**Supply Limited!**

Get your copy of "Blueprint for Industry—II" right now, because we are running short of this interesting 18-page engineering book.

*(This is No. 5 of a series. Reprints of previous advertisements will be sent free upon request)*

ENGINEERING VERSATILITY

**THE INDUSTRIAL *Oven Engineering* COMPANY**

11621 DETROIT AVE., CLEVELAND 2, OHIO

*Engineering Representatives in Principal Industrial Areas*

* ASSOCIATED COMPANY: JAMES DAY MACHINERY LTD., LONDON, W. 1, ENGLAND *

*Coated with*

# *Cellusuede* FLOCK

Youngsters will be delighted with the soft velvety "feel" of a Cellusuede Flock coating on their favorite toys . . . for instance the popular hobby horse.

Parents will be impressed with the way Cellusuede enriches the appearance.

There are numerous toys and playthings that can be made more attractive, more saleable, with an application of rich, colorful Cellusuede.

You will find it a simple, economical way to give your product new distinction and new appeal.

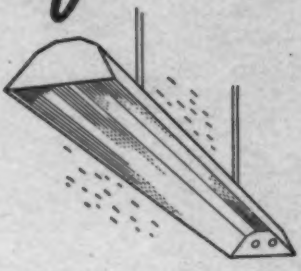
Cellusuede comes in a wide assortment of colors and is available for immediate shipment. We will be glad to send you all of the facts.

*Write today for FREE Booklet and Prices.*

CP *Cellusuede Products, Inc.*
ROCKFORD, ILLINOIS

USERS TELL US WE'VE DEVELOPED A

# *Better Finish for Fluorescent Reflectors*



**CHARACTERISTICS:**

Vedoc Reflector White has unusually hard surface and high reflectance qualities (consistently above 85%) . . . Retains original color and brilliance indefinitely . . . Easily kept clean (is unaffected by grease, dirt and most acids found in factories) . . . Highly resistant to heat. moisture and rust.

**APPLICATION:**

Only one coat is needed for steel. Finish is sprayed on . . . *not over* two one-thousandths of an inch film is required.

**BAKING TIME:**

20 minutes at 300° F. or 7 minutes with Infrared. (Optional Schedules are available.)

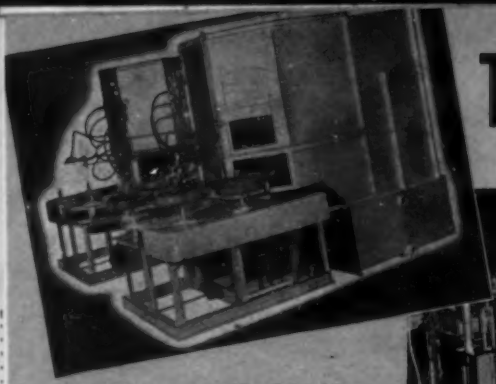
*Vedoc Reflector Gray, for channels and backs of reflectors, can be applied and baked at the same operation as the white.*

Vedoc

All *Vedoc* finishes are developed for a specific use, then slightly varied to best fit each customer's production setup. For more information about these "better finishes", write . . .

**LIQUID PLASTICS DIVISION**
**FERRO ENAMEL CORPORATION**
**CLEVELAND 5, OHIO**

# THE MOST



A DeVilbiss rotary machine that paints 1800 automobile brake drums an hour. Two of these machines saved their cost in the first nine months of operation.

A horizontal transverse DeVilbiss Automatic that paints small structural parts in less than 15% of the time required by manual spray painting.

A DeVilbiss gang spray machine with 10 stationary guns paints 148 inch wide corrugated metal sheets, applies 120 gallons of material an hour.

This DeVilbiss transverse machine costs thousands of more than 3 times the finishing speed required by the former method.

A DeVilbiss vertical transverse machine that helped greatly to speed the output of bomb cases for urgent war needs.

# VERSATILE LINE

## *of Automatic Spray Machines*

**DeVilbiss makes a wide variety of types for a great range of product finishing and coating operations**

The complete line of DeVilbiss Automatic Spray Machines may be the answer to your need for faster, more efficient finishing for peacetime production.

The widely diversified types of DeVilbiss Automatics include light and heavy duty rotaries, chain on edge, horizontal and vertical transverse, gang spray and others —each a complete finishing system. And their utility is demonstrated by the vast range of finishing and coating operations they perform, from tinting 1200 lamp shades an hour to painting 200 feet of pipe a minute.

If your product is adapted to automatic spraying, check with a DeVilbiss engineer. He will be glad to tell you about the speed, quality and cost advantages of DeVilbiss Automatic Finishing Systems.

**THE DEVILBISS COMPANY • TOLEDO 1, OHIO**
Canadian Plant: WINDSOR, ONTARIO

**DE VILBISS**
*Spray Systems*

SPRAY EQUIPMENT • EXHAUST SYSTEMS
AIR COMPRESSORS • HOSE AND CONNECTIONS

# . . . and there's no cure-all finish either

Regardless of the salesmanship behind it—a bottle of "snake oil" never proved to be a "cure-all." And the paint and varnish industry, to this writing, has never produced a "cure-all" finish either.

Rely on Reliance

Finishes, like medicine, must be prescribed if the end result is to be entirely satisfactory. Reliance has been "prescribing" finishes for many of the country's leading manufacturers for over 25 years. May we help you, too?

RELIANCE VARNISH CO., INC.
LOUISVILLE, KY. CHICAGO, ILL.

# THE NEW DELUXE Electro-Knife"

"Patent Applied For"
"Registered and Copyrighted"

## by FINISHINE

Deluxe "ELECTRO-KNIFE"

**$14.95**
**and well worth it.**
**Quantity Prices on Application.**

The Deluxe Model Electric Burning-In Knife for use with FINISHINE LACSTIX, PORCELSTIX, SHELSTIX, etc. Featuring the Air-Cooled Cork Handle with Fiber Heat-Breaker construction—patented Amphenol Take-Apart Cord Connector with Flexible Spring Type Insulated Cord Protector—Sturdy, Non-Breakable, Tite-Grip, Oil Resistant Rubber Plug with 10 feet of approved No. 18—3000 cycle Heavy Flexible Heater Type Oil Resistant Rubber Covered Cord. Cord may be taken off and carried separately in kit. Equipped with a Rocker Handle Black Casing Feed Through Single Pole On and Off Cord Switch—Gripper Clip for hanging up. Light as a feather! Designed for easy handling and rapid work. Ideal for FAST PRODUCTION.

Its purpose is to burn in STIX Stick Shellac, Stick Lacquer, Stick Porcelain, etc., and reduce Fire Risk. Many fires have been caused by the open flame Alcohol Torch. Much SAFER to use than the old style Alcohol Torch and Spatula in that it "PREVENTS FIRE" endangering Operators and Stock. Fire Underwriters and Fire Commissioners strongly oppose use of the torch with open flame. It may be used on 110-120 Volt Circuit A.C. or D.C. 60-cycle. It has a new type of Refractory Core Construction, a porcelain encased Heating Element made with finest long lasting Nickel Chromium Resistance Wire with correct Heat Control which makes it practically impossible to burn out; and the refractory porcelain that this coil is inserted in, is selected for its high thermohn and electrical insulating properties at elevated temperatures. Its maximum Thermostatically Controlled Heat is coordinated with the Stix Melting Point. A great Labor and Material Saver—"Stix-Mends" may be made neater, smoother and quicker. It comes equipped with a hand forged Solid Copper Spoon Type Blade which may be bent or ground to any shape desired; (interchangeable with a Flat Angle Type Blade available as extra equipment for $2.75) copper being used as it will spread and fill in Lacstix, Shelstix, Porcelstix, etc. with less adhesion. A High Grade Tool, Made Right and Guaranteed to Produce Satisfactory Results. No finisher's kit or work bench is complete without it.

### FINISHINE'S FAMOUS BURNING-IN STIX

Special Lactix made of the finest material, will not lift or shrink in or under lacquer—saves labor.

Special Shelstix made from choicest shellac gums and resins—a superior shellac stick.

Special Porcelstix to repair chipped porcelain, marble or tile. Easy to use, supplied in fourteen colors.

Stix are made in over three hundred colors—produces perfect results when used with the famous Deluxe "Electro-Knife."

### SPECIAL OFFER

| | |
|---|---|
| Deluxe "Electro-Knife" | $14.95 |
| 1 doz. Famous Assorted Lacstix | 4.44 |
| 1 jar Abrazo Extra, Extra Concentrate | .50 |
| 1 special Abrazo Felt | .11 |
| | $20.00 |
| Free to you 6 Famous Lacstix | 2.22 |
| SPECIAL OFFER PRICE | $17.78 |

# FINISHINE LABORATORIES, INC.

## SYRACUSE 4, NEW YORK

Fig. 1—The dry-off oven, after Bonderizing, consists of two 9-ft. sections.

# Conveyorized Painting and Infra-Red Drying Setup

HOW A COMPLETELY co-ordinated system of specially-designed infra-red ovens and conveyors enabled the Grand Rapids Metal Cabinet Co., of Grand Rapids, Mich., to step up efficiency in the mass-production painting of some of its products, is graphically shown in the accompanying photographs.

The company management felt that former methods of baking, drying and handling were too slow. Moreover, in order to guard against even slight variations in color, a method of baking and drying had to be devised that would assure an exactly uniform color over all. These problems were undertaken and solved by Mr. R. W. Stevenson, the firm's general manager and chief engineer, working together with Jensen Specialties, Inc.

Infra-red ovens designed and built especially for this setup, give not only full but absolutely uniform heat coverage, with no blank spots whatever in the heating zone. This is accomplished by employing a "staggered" arrangement of lamps. By "staggering" the lamps, any possibility of discoloration is eliminated, and the danger of overbaking certain areas of the painted boxes, while underbaking others is removed. The boxes are painted and dried in only 11 minutes time.

In order to keep the length of the ovens to a reasonable minimum, to save both space and initial cost of equipment, the covers of the

*(Continued on pages 28 and 30)*

Fig. 2—This picture shows metal boxes coming down from above, after baking the paint coating. The conveyor is loaded and unloaded at this station.

Fig. 3—This picture shows boxes entering a paint baking oven. The boxes are automatically dipped but the hasps are hand dipped and hung on bottom of hook.

metal boxes are hung on the conveyor sandwich-fashion, with only the edges being exposed directly to the heating lamps. This arrangement resulted in substantially more compact production than would have been the case had the covers been hung lengthwise. Doing this, however, posed the problem of getting the same metal temperature on the centers of the

*(Continued on page 30)*

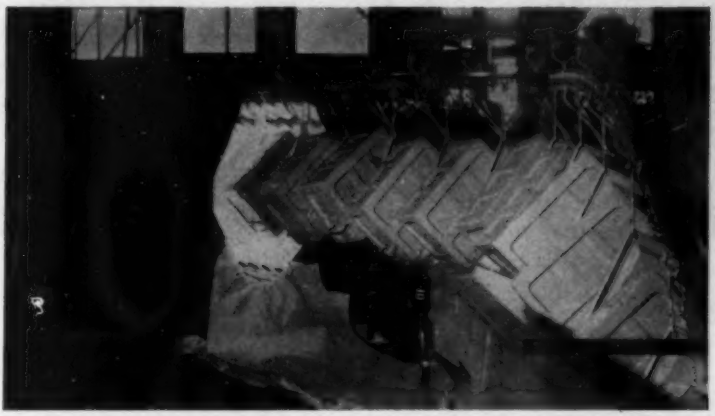
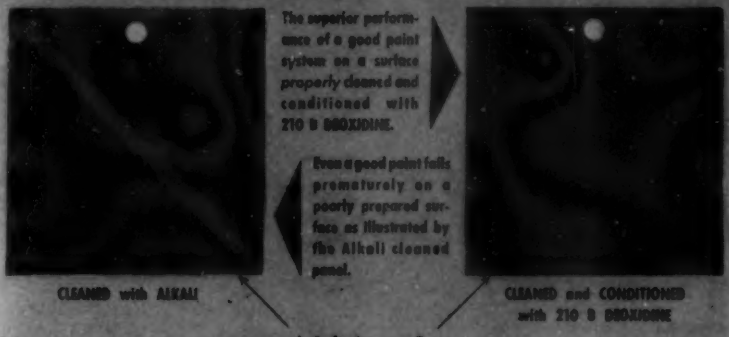


Fig. 4—This picture shows boxes coming upstairs to pass through a 48-ft. oven.

Fig. 5—This picture shows the cool-off area and caterpillar drive mechanism.

# Paint Finishes Endure on Properly Cleaned and Conditioned Surfaces


The superior performance of a good paint system on a surface properly cleaned and conditioned with 210 B DEOXIDINE.
Even a good paint fails prematurely on a poorly prepared surface as illustrated by the Alkali cleaned panel.
CLEANED with ALKALI
CLEANED and CONDITIONED with 210 B DEOXIDINE
Identical Salt Spray Exposure

## CLEAN AND CONDITION SHEET METAL with 210B DEOXIDINE

**THE 210 B DEOXIDINE** process is the simplest and most advanced procedure in metal preparation for paint. A minimum of low-cost operating equipment is required therefore, less than the usual amount of operating space is needed. The fewer necessary operations cut the production costs. Time and labor are saved and better results obtained.

**APPLICABLE TO LARGE METAL PRODUCTION**
210 B DEOXIDINE is ideal for completely mechanized spray process in power spray washers constructed of mild steel. A three stage washer is usually sufficient, but four stages are preferable if drawing compounds are present.

**A NATURAL FOR THE SMALL PRODUCTION PLANT**
210 B DEOXIDINE does not require expensive stainless steel equipment. Three stage washers which have previously been used for alkali cleaning can be used. The simplicity of controls of 210 B Deoxidine bath and process lead to uniformly good results.

**210 B DEOXIDINE** is but one of several war-proved Deoxidines — each created to meet different conditions. ACP Technicians will gladly advise with you and suggest the particular ACP products and processes which will efficiently meet your cleaning and conditioning problems. Write to Dept. B-12.

MANUFACTURERS OF LUBRICANTS AND METAL FINISH CHEMICALS

**AMERICAN CHEMICAL PAINT CO.**

Office and Warehouse 3665 Palmer Ave., Detroit, Mich. — AMBLER — ACP — PENNA. — Canadian Office and Factory Walkerville, Ontario

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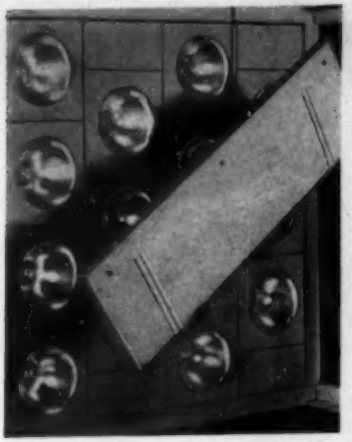


The Jensen method of "staggering" lamps to give an even distribution of heat. It eliminates the danger of overbaking certain areas and underbaking others.

covers as on the exposed edges. This problem was solved by using a combination of both convection and radiant energy heat.

Due to the angular hanging arrangement of the boxes (necessary to permit the paint to drain from the inside), the oven walls were designed and shaped in such a manner that the lamps are equidistant at all points from the painted metal boxes.

The conveyor system is arranged to carry the metal boxes from bonderizing operations through the dry-off oven; from there into the paint dip-tank; then up through the floor into the paint baking oven and finally into the cool-off zone, at the end of which they are ready for shipment.

A feature of the conveyor system is its use of large radius turns to prevent the possibility of the boxes bumping each other and marring the finish. Five 180° turns are included in the setup.

## Cleaning Brushes

THE finishing department of a large concern in Detroit has a set of rules for cleaning paint brushes. A guide for new men, for instances, states that the material to be used for cleaning paint brushes depends upon the kind of paint used. The guide points out:

"Brushes recently used in oil paint, enamel or varnish may be cleaned with turpentine.

"Brushes used in shellac or alcohol stain should be cleaned with alcohol.

"Brushes used in lacquer should be cleaned with lacquer thinner, preferably the same kind of thinner supplied by the manufacturer of the lacquer.

"Brushes used in water-thinned paint should be cleaned with water and thoroughly dried before storing."

A fact that cannot be too strongly stressed is that before using brush-cleaning compounds, it is always highly important that the manufacturer's instructions be read and carried out to the letter.—F. C.

---

## *International Lighting Exposition at Chicago in April*

"See the latest in the world of lighting—Stevens Hotel, Chicago, Ill., April 25 to 30," proclaims the official seal of International Lighting Exposition. Lighting people, and others interested in the application and utilization of commercial and industrial lighting equipment, will see a great deal of the seal during the next few months.

"The Exposition and Conference is something which all of us in the Lighting Industry should be eagerly awaiting. By means of this little seal, which will appear in many of the exhibitors' magazine advertisements and other advertising, we hope to remind everyone who has anything to do with the use, application and sale of lighting equipment that April 25th is a most important date . ... and that it's the lighting man's date to be in Chicago for the International Lighting Exposition and Conference."

# Send For This *FREE* Digest on Oakite Surface Preparation

DIE CASTINGS that are to receive organic, chemical or plated finishes for protective purposes or sales appeal must be FIRST thoroughly cleaned. This newly-published Oakite Digest "Production Cleaning of Die Castings" gives you valuable data on low-cost surface preparation methods based on the successful experience of hundreds of producers and users of die castings.

Aluminum, zinc, magnesium, brass, bronze . . . practically every alloy and the techniques and Oakite materials employed in cleaning or related operations on die cast parts are fully discussed so that you can make comparisons with your present methods or find a new answer to some surface preparation problem now confronting you.

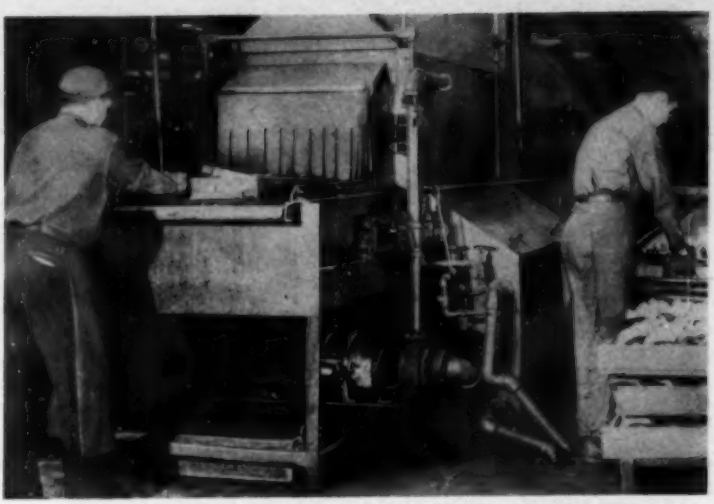
## Free Copy on Request

Because it can save money for you, send for a copy of this fact-filled Oakite Digest today. It's yours for the asking.

**OAKITE PRODUCTS, INC., 32F Thames Street, NEW YORK 6, N. Y.**
***Technical Service Representatives in All Principal Cities of the United States and Canada***

**OAKITE** MATERIALS · METHODS · SERVICE — Buy Bonds for Victory — **CLEANING** FOR EVERY CLEANING REQUIREMENT

# Degreasing Die Castings



Photograph furnished through courtesy of Metalwash Machinery Company.

BY ARTHUR P. SCHULZE

**Here is a nut-shell review of tried-and-true techniques for expediting one key production job that poses many problems for finishing foremen today.**

SUBSTANTIALLY increased use of die castings in making the implements of war, presages their utilization on a still broader basis in fabricating the products of peace.

With full production of civilian goods shifting into high gear, now that the "green light" has been flashed by the Government, this rapidly developing trend is expected to put many finishing foremen working with die castings for the first time squarely up against several problems. One is cleaning.

From all current indications, degreasing promises to head the list from the standpoint of both immediate and long-range importance. Partial evidence of this may be found in the fact that over 50% of the die castings produced and used by American industry today are given a final surface finish of one type or another.

In some cases, this treatment is applied for surface protection and corrosion resistance; in others, it is to provide added utility and extra wear; in still other instances, it is for reasons of appearance, decorative effect and color. Then

# *CHEMICALS to Clean and prepare metal for painting

**Sol-Klean . . .** PHOSPHORIC ACID METAL CONDITIONERS

**Prezaint . . . .** MAKES PAINT STICK TO ZINC AND GALVANIZED

**Industrosolv.** SOLVENT EMULSIONS FOR SPRAY WASHING MACHINES

**Phosmul . . . .** SOLVENT EMULSIONS CONTAINING PHOSPHORIC ACID

**Industro . . . .** ALKALI CLEANERS AND AIR WASH COMPOUNDS

**Sep-Cote . . .** SPRAY BOOTH COATINGS

**Write for informative literature.*

**SOL-KLEAN** is used to prepare steel and aluminum for painting. Rust, oxides and oil are removed and corrosion producing agents are neutralized by it. Also, Sol-Klean etches the metal and gives it a thin phospate coating.

For use one volume of Sol-Klean is diluted with 2 or 3 volumes of water. The resulting solution is usually brushed on the metal at room temperature. It adheres to the oily surface, penetrates the oil and mixes with it, and dissolves the rust. Then the Sol-Klean is removed together with the dissolved oil and rust by wiping with rags or flushing with water.

Metal may also be cleaned and treated by immersing it in hot Sol-Klean and rinsing it in water. Sol-Klean is non-inflammable and no noxious or corrosive fumes are evolved.

Sol-Klean is easy to use and can be made an integral part of your production line.

*Metal treating and cleaning chemicals for 25 years*

**INDUSTRIAL CHEMICAL PRODUCTS CO.**

**3779 BELLEVUE AVE. DETROIT 7, MICH.**

*Representatives in principal midwestern cities*

again, surface finish is applied to enhance eye appeal and saleability of product.

But there is another vital reason, long fully recognized by many progressive manufacturers although not so keenly appreciated by others less far-sighted, why cleaning is considered so important as a prime factor in the production cycle.

It is the additional fact that cleaning is the keystone to quality finishing; here is the first step that governs, in no small measure, the ultimate result. Irrespective of the particular reason for applying to various products plated or painted finishes or other chemical coatings, *success of the finishing process depends first and foremost upon effective preliminary removal of oil, grease, shop dirt or other contaminating accumulations from the base surface.*

As M. A. Glaser so aptly pointed out in a guest editorial that appeared in September issue of INDUSTRIAL FINISHING, "the finest finish in the world will not give good service over an improperly prepared metal surface." Nor can directly related effects of finish failure be brushed aside casually. When good adhesion is not secured, rejects result; this increases unit costs, retards production and curtails output. Long experience confirms this.

So, in view of all these things, it may be particularly helpful at this time, with the nation having turned from the production of swords to the manufacture of plowshares, to capsulize for quick reading and better understanding by finishing executives, certain methods and materials that enjoy wide use throughout the nation today for degreasing die castings.

Any discussion of this general matter of cleaning die castings before finishing, however, is predicated upon full recognition of the fact that there are certain variables prevailing in nearly every plant. These variables affect, to a considerable degree, both the particular material used and its method of application in any given instance. Among those conditions that must be taken into serious consideration when selecting detergents for die castings are:

### Factors to Consider When Planning a Setup for Cleaning

1) The die cast metal or alloy itself—whether it is aluminum, zinc, magnesium, brass, bronze, copper, lead or tin base.

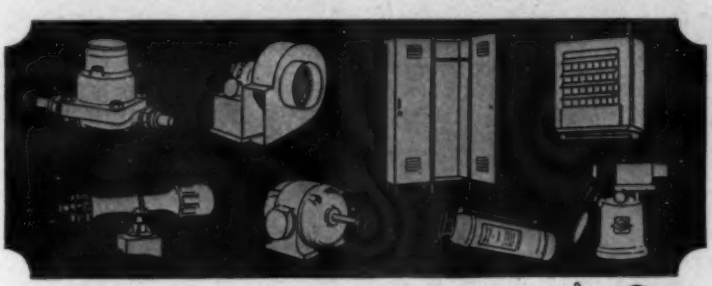
2) Nature and extent of oil, grease, burnishing or buffing compound, shop dirt or other contaminating deposit or film on surface of die casting.

3) Water characteristics, equipment available, production requirements, etc.

4) Degree of surface cleanliness required.

5) Type or character of finish to be applied.

While pronounced progress has been made during the past decade in the development of specialized cleaning compounds for specific purposes, no one single material has yet been designed for satisfactorily degreasing all die cast metals. In cleaning the comparatively "soft" metals — aluminum, zinc and copper, for example— safety to surfaces usually dictates the use of agents entirely different than those employed for other metals. On the other hand, paradoxical or contradictory though it may sound, it is frequently desirable to slightly etch aluminum or zinc die castings, as an integral part of the degreasing operation, in order to furnish a foun-



## If you make things like these

**BY ALL MEANS INVESTIGATE**

# SILCO

**GLASS-BASE PROTECTIVE SPRAY COATING**

**The modern finish for stoves, heaters, mufflers, radios, files, lockers —all steel and brass products that must undergo extreme heat (up to 1000° F.), dampness, corrosive gases, abrasion. Spray it on and dry at 200° F. Then bake at 350° F. in any industrial oven. Available in all colors. Send for sample and full details.**

# BLACK MAGIC

***DEEP PENETRATING* 1-BATH OXIDE BLACK FOR STEEL AND IRON**

**This single bath gives iron and all steels except stainless a dense, permanent black that won't rub off (penetration .0001"). Very flexible; products may be formed after processing. Also an effective rust inhibitor and a fine bond for paints and lacquers. Chemical reaction at 300° F. There are also BLACK-MAGIC baths for zinc, copper, brass and cadmium. Sample and details on request.**

BLACK-MAGIC BLACKING SALTS for STEEL, IRON COPPER, ZINC CADMIUM

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Cleaners Wetting Agents Acid Inhibitors Heat Treating Salts

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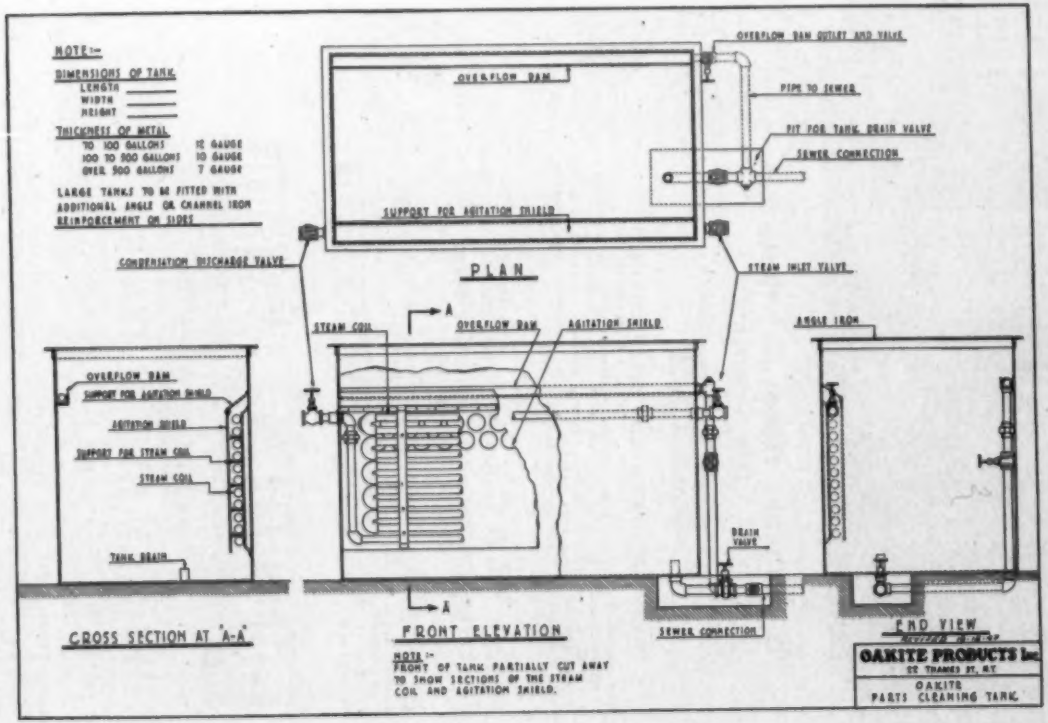
NOTE:-
DIMENSIONS OF TANK.
LENGTH
WIDTH
HEIGHT
THICKNESS OF METAL
TO 100 GALLONS 12 GAUGE
100 TO 500 GALLONS 10 GAUGE
OVER 500 GALLONS 7 GAUGE
LARGE TANKS TO BE FITTED WITH ADDITIONAL ANGLE OR CHANNEL IRON REINFORCEMENT ON SIDES
OVERFLOW DAM OUTLET AND VALVE
OVERFLOW DAM
PIPE TO SEWER
PIT FOR TANK DRAIN VALVE
SEWER CONNECTION
SUPPORT FOR AGITATION SHIELD
CONDENSATION DISCHARGE VALVE
PLAN
STEAM INLET VALVE
A
STEAM COIL
OVERFLOW DAM
AGITATION SHIELD
ANGLE IRON
OVERFLOW DAM
SUPPORT FOR AGITATION SHIELD
AGITATION SHIELD
SUPPORT FOR STEAM COIL
STEAM COIL
TANK DRAIN
DRAIN VALVE
A
CROSS SECTION AT 'A-A'
FRONT ELEVATION
SEWER CONNECTION
END VIEW
NOTE:-
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PARTS CLEANING TANK.

dation or "tooth" for the tenacious adhesion of the primer coat—or the finish coat on one-coat jobs.

**For Effectively Cleaning Aluminum Die Castings**

To clean aluminum die castings without etching, pitting or discoloration, several specially-designed buffered alkaline-type detergents, made by responsible manufacturers, are commercially available today. Magnesium die castings are resistant to most alkalis, and for that reason, alkaline degreasing

* * *

**Illustration on Opposite Page**

Referring to the drawing on opposite page, here is one suggestion for the design and construction of a steam-heated cleaning tank in which metal parts can be cleaned in an agitated solution preparatory to painting. The drawing is furnished through courtesy of Oakite Products, Inc.

Steam coils are fitted against the front side of the tank, nearest the operator. The overflow dam is on the far side. The surge of the *boiling* solution tends to drive any floating oil or dirt across the tank to the dam, therefore the solution nearest the operator is always comparatively clean.

A shield is fastened over the steam coils to increase the agitation created by the heat of the steam coils. The two rows of holes near the top of the shield permit the violent discharge of cleaning solution from the section inclosed by the shield. As the solution passes out of the holes a corresponding amount of solution is drawn in under the bottom edge.

The agitation shield must fit tightly against each end of the tank. The overflow dam is perfectly level to allow the solution to overflow uniformly at all points.

agents may be successfully used to remove contaminating deposits before application of chemical or organic finishes.

Soil removal is generally a problem of considerable magnitude. Usually, die castings are not covered with an appreciable amount of heavy oil and grease deposits, therefore their removal is greatly simplified. But the tenacious deposits remaining after the operations of "cutting down" and color buffing are performed—these cast a far different and more complex complexion on the question of cleaning. They generally present a vexing problem due to: 1) the constituents of buffing compositions; 2) the extent to which they become imbedded in microscopic fissures of the metal surface and in recessed areas; 3) heat generated in the buffing operation itself; 4) time interval between buffing and degreasing.

Depending upon the type of finish applied, this class of work may be effectively handled with emulsifiable solvents supplemented by alkaline compounds. Solvent emulsion cleaning may also be utilized advantageously before deburring, "cutting down" or color buffing operations; alkaline degreasing in many cases, however, may also be employed with correspondingly efficient results.

Of equal importance to the correct choice of cleaning materials for various die castings, are the methods of application. Each is dependent upon the other. Here again, the equipment available, production rate, cost, extent and character of deposits on surfaces, and the type of finish to be applied, are factors that influence the technique utilized in each case.

Tank immersion is one of the most common and economical pro-

cedures for removing machining oil, grease, chips and shop dirt. With this method, aluminum or magnesium die-cast parts are "soaked" in a hot solution of the proper alkaline detergent for a short period, depending upon the character and extent of deposits present, after which the work is subjected to a thorough cold running rinse. When buffing compound must be removed, a liquid emulsifiable solvent or an oil-soluble emulsifier is frequently recommended. That is because the penetrating action provided by this type of material is necessary to saturate and loosen deposits, enabling them to be completely removed with little or no brushing after a thorough hot rinse.

**Washing Machine Method; Also, Vapor Degreasing**

Another popular technique that assures fast, effective results where aluminum, magnesium or zinc die castings are coated only with light oils, grease, chips or shop dirt, is the washing machine method. Solution tanks of machines are charged with any one of a number of fast-working, free-rinsing alkaline compounds especially suitable for machine application. In addition to their degreasing power, materials used for this work by this means should be selected also for their ability to retard the formation of foam and to keep sprays and solution lines free of insoluble deposits that impair mechanical cleaning action of the machine.

Still another highly favored degreasing method in preparing die castings for finishing—one that has enjoyed a steady growth during the past few years—is electrocleaning, employing either cathodic or anodic current, depending on conditions and work to be cleaned, in combination with alkaline materials expressly designed for electrolytic application. It is extremely versatile. With certain operational variations in temperature, current amperage and concentration of solution, it is being successfully used with outstanding results for cleaning aluminum, zinc, antimonial lead, and tin alloys.

**Metallic Oxide on Aluminum Poses a Problem**

It should be pointed out, in connection with aluminum alloys, that the metallic oxide usually present is *not* removed by the cleaning operation. Yet it *must* be removed before anodizing, Alroking, black finishing or similar chemical coating treatments, or before electroplating, if a satisfactory finish is to be secured.

In such cases, parts are cleaned in the usual manner, by any one of the methods described heretofore; then they are given a special acid bath, after which subsequent finishes should be applied as quickly as possible. Removal of this metallic oxide, particularly where parts are to be anodized, permits a far superior job, with greater color uniformity of the dyed anodized coatings.

Where specifications require a light etch on aluminum die castings, the choice of the particular material to be used for etching depends on the particular alloy to be treated, its condition when ready for the etching bath, and the depth or appearance of the etch required. If aluminum is not heavily coated with foreign matter, cleaning and etching generally can be accomplished at the same time. Otherwise, degreasing should be performed with a material that has no etching action whatever.

The same combined alkaline cleaning-acidic conditioning treat-

Illustrated is Remington Rand's High Speed photo copying equipment which quickly and economically reproduces photos up to 20 x 24". These machines are finished to stand up under rugged service, with hard, durable, smooth textured Nu-Spede Wrinkle Black by Lowe Brothers.

## Unusual Baking Conditions Do Not Affect Lowe Brothers Nu-Spede Wrinkle Finish

As its name implies, Lowe Brothers Nu-Spede Wrinkle Black is designed to expedite the finishing of many products which must have eye-catching sales appeal and a tough, durable resistance to rugged service conditions.

In addition to having a hard, smooth texture and excellent resistance to abrasion, Lowe Brothers Nu-Spede Wrinkle Black has exceptional and long lasting elasticity and durability.

Furthermore, Nu-Spede Wrinkle's ability to give unvarying texture despite unusual baking conditions is an outstanding feature which greatly contributes to efficient and economical production. For example, even though the component parts of a product finished with Nu-Spede Wrinkle remain on a rack before being placed in baking oven as long as 45 *minutes* apart —the same *uniform* texture characterizes each final part.

Why not call on Lowe Brothers' experience in supplying finishes to a wide variety of important manufacturers of machinery and equipment to solve your finishing problem?

Request for advice involves no obligation.

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ment employed for removing metallic oxide from aluminum alloys, is used in preparing zinc die castings for finishing to inhibit or minimize formation of zinc "soap" which often occurs through reaction of organic finish vehicles with the zinc surface. Cleaning with either an alkaline or solvent-type detergent, in this particular instance, removes contamining deposits; "conditioning" neutralizes any alkaline film that may remain on the surface due to insufficient rinsing, produces a slight etching effect, and treats the surface so that the possibility of undesirable zinc "soap" formation is controlled and minimized. As a result, rejects due to peeling, blistering, chipping, etc., can be avoided or prevented—that is, to a large extent. In other words, where good adhesion is essential or where high-quality finishes are applied, both cleaning and conditioning of the zinc surface are necessary and vital.

### Two-Step Degreasing Cycle Includes Pre-Soaking

Current production practice indicates that, in many instances, a 2-step degreasing cycle is preferable to a single operation because of its demonstrated ability to turn out better work faster and at lower cost. A preliminary pre-soaking operation has a decided advantage; for example, in those cases where discoloration or etching is to be avoided. The same is equally true in those instances where die-cast work is covered with unusually heavy deposits of tenaciously adhering buffing compounds, or where the alloy is such that concentration and temperature of cleaning solution and time factors are critical.

Plant after plant following the 2-step procedure invariably have discovered that the pre-soak operation removes most deposits, thereby substantially speeding up the final cleaning. Moreover, contamination of the final cleaning solution is avoided, lower concentrations of cleaning material frequently may be employed, and life of the degreasing solution itself is prolonged.

Where solvent degreasing is performed either in a dip-tank or mechanical washing machine, or where vapor degreasing equipment is installed, a second alkaline cleaning operation is always required to produce the chemically clean surfaces incidental to a chemical or plated finish on die castings. For this operation either still-tank or electro-cleaning methods are highly suitable.

Surface preparation of zinc die castings for chemical or plated finishes may be effectively handled by a one-step single-tank degreasing method, supplemented by acid conditioning as we have previously indicated; but nevertheless it also affords an excellent example where 2-step cleaning is frequently followed. Two different procedures are available for handling this job under the 2-step system. One is tank degreasing with an alkaline material, followed by electro-cleaning using direct current; the other, preferred when die cast parts are heavily coated or loaded with buffing compounds, consists of a pre-soak with a solvent material, supplemented by using reverse current with a different alkaline material than that specified in the foregoing procedure.

### Removing Buffing Compounds From Aluminum

Still another common instance where 2-step cleaning often proves superior from the over-all results standpoint, is presented by the removal of buffing compounds from aluminum die castings. For aver-

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age work, the tank technique is used in conjunction with the Saturol Process, which comprises, first, immersing parts in the Saturol solution (made up with a special liquid emulsifiable solvent cleaner) to penetrate, saturate and loosen deposits; and second, giving parts a thorough hot rinse to remove the wetted-out inert matter. If a chemical or plated finish is to be applied, final alkaline degreasing by tank immersion or electro-cleaning is required to remove the light trace of solvent remaining on the surface from the Saturol Process and put parts in the chemically clean condition required for finishing.

An alternate cold solution method for removing many buffing compounds from aluminum die castings, is provided by the use of an oil-soluble emulsifier which is generally employed in combination with kerosene, light fuel oil or similar hydrocarbon solvent. But here again, if parts are to be subsequently plated, a chemically clean surface is required, making necessary degreasing in an alkaline solution either by tank immersion or electro-cleaning method.

**Technique of Cleaning Brass, Bronze, Copper**

The two-step method may also be utilized for cleaning brass, bronze and copper alloy die castings. As most finishing foremen know, avoidance of tarnish or oxide formation is desirable when removing deposits of oil, grease, buffing compounds, shop dirt, etc., from these alloys. Various alkaline detergents may be employed for this work, first by tank immersion and then by electro-cleaning, depending upon such controllable factors as type of surface oil, water conditions, equipment available, type of finish applied, alloys, and whether or not physically clean or chemically clean surfaces are essential.

Through scientific research it has been found that a substantial improvement in cleaning brass, bronze and copper can be effected on various classes of work by a series of steps which *intentionally* place a uniform tarnish on the work and then remove it. Known as the Oxbrite Method, this sequence provides many advantages, particularly where brass parts are buffed and finally electroplated. Steps involved may be briefly summarized as follows:

1) Immerse the work in a tank containing proper alkaline solution; concentration, 4 to 6-oz. to each gallon of water; temperature, 180° to 200° F.; time, 5 to 10 min.

2) Cold running rinse.

3) Electro-clean in solution of second alkaline detergent; concentration, 4 to 8-oz. to each gallon of water; temperature, 180° to 200° F.; reverse current, 20 to 50 amps. per square foot; time, 20 seconds to one minute. This operation produces a controlled uniform tarnish on buffed surfaces.

4) Thorough cold rinse.

5) Sulphuric acid dip, 15% to 30% by volume, to remove tarnish.

6) Follow with clean running rinse, then electroplate.

When unusually heavy and tenacious deposits of buffing compounds are present on surfaces, a solvent pre-soak may be required prior to alkaline degreasing and electro-cleaning.

If it be true that efficient cleaning is absolutely essential to quality control in finishing, then it is equally true that good rinsing is likewise related to cleaning. So a few words regarding rinsing.

When it comes to obtaining either physically clean or chemical-

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ly clean surfaces prior to subsequent finishing, the importance of adequate facilities for rinsing after cleaning cannot be underscored too strongly. Materials used for cleaning, therefore, should incorporate ingredients that promote and contribute to free rinsability. Extra rinsability is a safety factor and an asset because, as production cleaning and finishing practice has indicated time and again, thorough rinsing and the equipment to provide this requisite are as essential and necessary to securing prime-quality finishes as the degreasing operation itself.

**Follow Chemical Cleaning With Rinsing**

Here's another helpful hint passed on by many finishing executives: Where cold or hot rinses are used as the final steps in tank immersion degreasing, the rinse water should be maintained in clean condition and constantly replenished. Best results are assured when the fresh water is admitted to the tanks by means of two perforated pipes. One is located in the bottom; the other at the solution level on the opposite side to the overflow dam, with the perforations pointed toward it. Rinse tanks should always be provided with an overflow dam to expedite removal of oil films from the surface of their contents.

While a hot rinse is generally preferable to a cold rinse, maintaining a free-flowing hot rinse is usually expensive and difficult to supply. It is especially important therefore, where cold rinses are used, that the operation be performed with utmost care and thoroughness, and that the rinse water be kept clean.

From this general discussion, it is obvious that cleaning die castings represents a job which is dependent upon numerous factors and conditions on the production line. Certainly it is clear that cleaning problems involving die castings are like fingerprints—no two are exactly alike. That is why degreasing often presents perplexing problems to the finishing foreman.

But as every dark cloud has a silver lining, so the finishing foreman has the encouraging ray of help before him. He has a choice of several scientifically formulated materials and methods which may be readily adaptable for degreasing die castings on the fast, efficient, safe, economical basis to which his production finishing technique is keyed. He also has, at his ready command, the free personal services and specialized technical knowledge of men who have made the science of metal cleaning their life work.

These service representatives are members of nation-wide field staffs maintained by competent organizations devoted exclusively to the twin tasks of developing new cleaning compounds and further improving existing materials to constructively aid industry in its never-ceasing efforts to step-up finishing quality. They take deep pride and personal interest in apprising finishing foremen of the newest degreasing developments, and helping them untangle new or unusual production cleaning kinks through the application of performance-proved principles and time-tested ideas that have so substantially benefited others faced with the same or similar problems.

---

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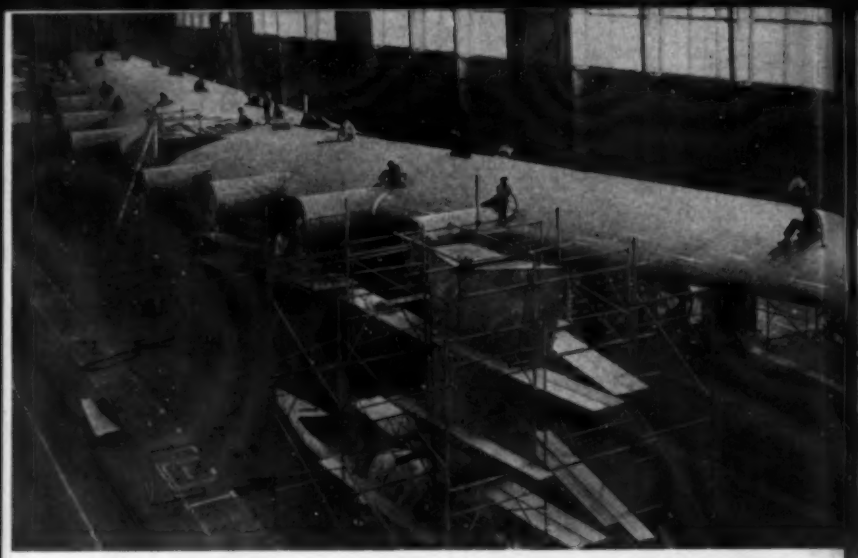
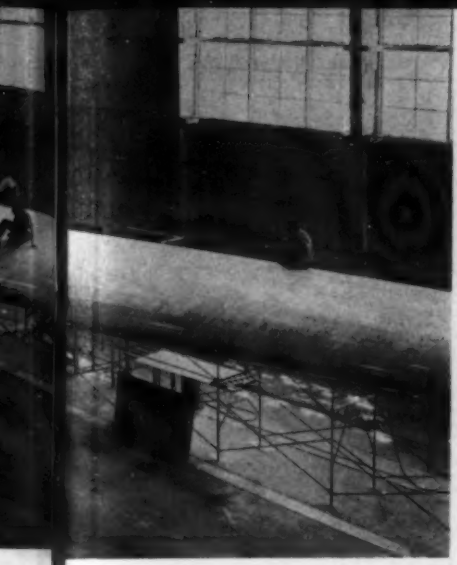


# ☆ Finishing the World's

WHEN THE HUGHES H-4 flying boat, the world's largest airplane, lifts its 400,000-lbs. gross weight into the air some day next spring, the venerable history of wood construction will have achieved a new triumph. At the same time, the men responsible for gluing, sealing and finishing the plywood structure can chalk up an impressive accomplishment. They have solved a problem which, prior to beginning construction on the H-4, seemed physically insurmountable.

Size of the flying boat is alone indicative of the numerous difficulties that had to be met and overcome. Wingspread of the H-4 is 320-ft., which is 20-ft. longer than a football field. The hull is 220-ft. long, 25-ft. wide, and 30-ft. high. Eight 3000-hp. engines will drive the 4-bladed propellers which are 17-ft. in diameter. Two average tank cars of gasoline are required to fill the fourteen 1000-gallon fuel tanks. Less metal is used in the entire airframe than what is required to build a single-seated fighter airplane. More than a million glue joints, each carefully hand-matched, will hold the giant structure together!

Five types of wood are used in building the H-4; they are poplar, maple, aircraft birch, some balsa, and a minimum of high priority aircraft spruce. The wood arrives at the Hughes plant in veneer panel sections. Thicknesses range from 1/64 to 1/8-in. Very few solid wood components are used in the entire airplane.



BY GILBERT C. CLOSE

Working on the 320-ft. wing of an H-4 flying ship. This wing measures 13-ft. thick where it will join the hull.

# Largest Airplane ☆ ☆

**Maintaining Uniform Moisture Content of Wood in Process**

One of the greatest problems involved was maintenance of constant moisture content in the wood during storage, gluing, fabrication, and until sealing could be accomplished. The project required erection of a huge wooden building covering eight acres in area. The building is 750-ft. long, 250-ft. wide, and over 100-ft. high. Atmosphere within the building is carefully controlled ranging between 52% and 58% relative humidity at 75° F. temperature.

A tremendous amount of research that will eventually benefit many industries was carried out relative to production of dependable high-strength glue joints . . . Another problem was maintenance of constant glue line thickness. The best thickness of a glue joint was found to be approximately .003-in. Heavier glue lines tend to craze and loose strength, while thinner glue lines never attain maximum possible strength.

Three types of synthetic resin glues were used in fabricating the laminated sections, and in gluing finished components together. Parts that could be through-heated, either in an autoclave or by high frequency induction heating, were glued with a phenol formaldehyde resin and cured at approximately 300° F. Wing spars, stringers, longerons, stiffeners, and similar parts, too large and too thick for heating, were glued with a urea-formaldehyde resin that cures at room temperatures. The urea glue

Smooth shiny hull of H-4 flying ship after application of finishing process which makes it waterproof and serviceable under various salt air conditions.

was also used in assembly work. A newly developed resorcinol formaldehyde resin was used for gluing the joints in the hull skin. All glues were artificially colored so that they could be recognized after application and curing.

To attain maximum strength, panels were built up from sheared veneer strips, averaging 6 to 10-in. in width, edge-glued together and staggered at 90° in successive laminations. Flat panels were cured in an ordinary heated flat press. Formed panels requiring complex and re-entrant curvatures were cured by the Duramold process in huge autoclaves. Most of the smaller billet stock components were cured by induction heating.

Immediately after curing, all laminates were sprayed with water to replace moisture lost during the heating process. Maintenance of moisture content was of vital importance until the part reached the stage where sealing could be accomplished.

The hull of the H-4 is of all wood construction with the exception of a few metal fittings. The bulkhead skins and frames are of birch panel, and stringers are of composite birch and spruce laminates.

The cargo floor of laminated ¾-in. panels, is designed to carry a load of 125-lbs. per square foot. By planking this floor, a 60-ton Army tank can be driven in through the nose of the ship and safely supported during flight. Hull space below the floor is divided into 18 water-tight compartments, two-thirds of which may be flooded and the ship will still remain afloat. Each compartment is sealed with a sealer resistant to water and gasoline.

### Special Finishing Process Waterproofs Wood Surfaces

As soon as possible after assembly, interior components of the flying boat were given a coat of wood filler, followed by a coat of sealer to protect them from the atmosphere. Many of these components have now been installed for many months with no signs of deterioration.

Finishing the exterior portions of the hull presented a number of difficult problems. Considerable research preceded the actual finishing

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operations. As a flying boat, the hull of the ship would have to be protected from sea water, as well as from all other deteriorating influences in the atmosphere. At the same time it would have to present a perfectly smooth surface to maintain aerodynamic efficiency.

After assembly, the hull skin was given a coating of wood filler, followed by a coating of sealer. The next step was application of a thin layer of tissue paper over the entire hull surface. Regular paper hangers were employed for this job; the paper was applied in much the same manner as when papering the walls of a room.

Two coats of clear spar varnish were applied over the tissue paper, followed by a single coat of aluminized spar varnish. Numerous tests on panels protected in this manner indicated that this finish system will meet the conditions that will be imposed on the H-4 during service.

It still remains to be proved that the H-4 will be an efficient and economical cargo airplane. Nevertheless, problems overcome in construction of the giant plane will lend new confidence to those interested in wood construction. The knowledge gained from research on wood preservation, gluing, forming, and finish systems will be of benefit to all who are or may be concerned with the manufacture and finishing of wood products.

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## *Interchemical Forms Finishes Division*

The operations of Ault & Wiborg Division of Interchemical Corp. and Murphy Finishes Corp., an Interchemical subsidiary, were consolidated on November 1 and will be continued by Interchemical Corporation Finishes Division. It has been announced by Joseph R. Esposito and Charles J. Roh, the respective heads of these two units. Both firms are well-known manufacturers of enamels, lacquers, varnishes, paints and other finishes.

Ault & Wiborg, established in 1878, has been a member of the Interchemical group since 1928. Late in 1944, Interchemical expanded its position in the finishes field when its subsidiary, Murphy Finishes Corp. acquired the assets and business of Murphy Varnish Co., which dates its experience back to 1866.

For the past year, the two units have operated independently, each specializing to a large extent in cer-

Joseph R. Esposito . . Charles J. Roh

tain branches of the finishes field and marketing products which were leaders in these branches. The unification, according to Mr. Esposito and Mr. Roh, now brings within one division a wide background of successful and diversified experience in metal finishes, wood finishes, metal decorating, can and drum linings, cable finishes, grain reproduction finishes, transportation finishes, household paints and specialties. Operating as a single unit, the Finishes Division will have the benefit of the research facilities of both, augmented by the fundamental research program of Interchemical Corp., as well as a nation-wide integrated network of factories, warehouses, laboratories and service stations.

Industrial products formerly sold under the names of Ault & Wiborg and Murphy will now be sold as Interchemical products. The Murphy brand name and trade mark will be retained for consumer products.

Officers of the new division, which will have its headquarters in the Empire State Building, New York City, are Charles J. Roh, Division Chairman; Joseph R. Esposito, Division President; Joseph G. Morris, Division Executive Vice-President; Paul S. Kennedy and Mark Frishkorn, Division Vice-Presidents.

*Flash!*

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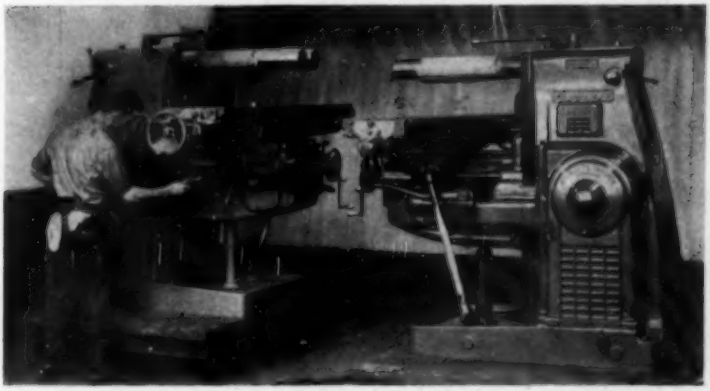
# Reconversion Finish of Machine Tools

**During the war the author worked with several machine tool manufacturers as finish consultant. Some results of his observations, while in actual contact with shop conditions, are among the suggestions he makes in this article.**

**BY C. RAYMOND SYER**
**Consulting Industrial Engineer**

WE ARE now in the reconversion period which has been talked about so much during the past two or three years. Consideration will be given to the adoption of new paint materials and equipment that are now available. Each manufacturer will want to take advantage of them in order to put the best possible finish on his products at a minimum cost. With this fact in mind it is my opinion that machine tool manufacturers will go back to their prewar types of finish. A well finished machine tool is a pleasure to look upon, and it inspires in its owner and operator a highly desirable sense of power.

In pre-war days, machine tool manufacturers considered the paint finish an important factor and endeavored, in most instances, to have their machines finished and shipped with a smooth glossy durable finish. The finish, in most cases, was produced by using the following materials: Prime coat, knifed filler, glaze coat, sealer coat, and the final finishing coat — either enamel or lacquer. The number of coats of certain materials used depended



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upon: 1) the surface condition of castings, and 2) the specified type or quality of finish desired by the management. The sequence of operations varied in different plants according to their routing and production methods.

### Quality of Paint Jobs Lowered During War

On April 27, 1942, the War Production Board issued Limitation Order L-108, prohibiting the use of filler and restricting the number of coats to only one of primer or sealer and not more than two coats of paint, enamel or lacquer, in the finishing of machine tools. Also, the final coat of paint, enamel or lacquer had to be "machine tool gray", notwithstanding many requests of customers for other colors. Happily, these restrictions have been revoked. However, it is obvious that because of these restrictions during the war, the all round quality and appearance of machine-tool finishing dipped to an all time low. In many cases new men will have to be given proper instruction in the use of materials and equipment to obtain the desired results for a reconversion finish.

In returning to the better type of finish it must be understood that the appearance and durability of the top coat or finishing coat depends upon how well the surfaces of castings are prepared and how thoroughly the correct undercoat materials are applied, dried and smoothed.

### What Contributes to Fine Quality Paint Jobs

Among the main practices to be adopted in efforts to secure a smooth, durable and economical finish are: 1) the proper upkeep of foundry patterns, 2) careful control of foundry practice to produce the type of casting surface desired, 3) centralization of painting operations in a strategic location, 4) use of the correct painting materials and equipment, 5) mechanization of methods; and 6) adoption of straight-line production.

Surface cleanliness is a major requirement for success in any kind of product painting. Rust, dust, grease, grit and any marks or smudges of foreign matter must be eliminated before good finishing is possible. If rust is allowed to remain on a metal surface, it will prevent proper adhesion of the finishing material; sometimes it discolors the coating material by its chemical action; and usually it spreads, resulting later in the paint blistering or flaking off. Oils and greases on the surfaces produce similar effects. Dust and grit, coming through the thin finishing film, give it a rough surface which is definitely undesirable.

These foreign substances can be cleaned off by the use of one or more of several methods. The recommended process is to remove them chemically, with an acid or alkali solution. Rust can be prevented by the use of a rust-preventative primer which should be applied after the "snagging" operation (grinding off projecting nibs, pimples, etc.).

Before the war and during the war I contacted many of the machine tool manufacturers, examined their painting activities, and was engaged by several to streamline their production and to make improvements in their surface paint jobs. During these examinations I noticed that too little emphasis was placed on the need of a suitably surfaced casting to produce the desired paint job at a minimum cost. If "snagging" operations had been improved upon by removing all of the high spots, less filling material would have been required

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to build up a smooth surface. The sanding time would have been reduced, to say nothing about obtaining a more durable and satisfactory finish.

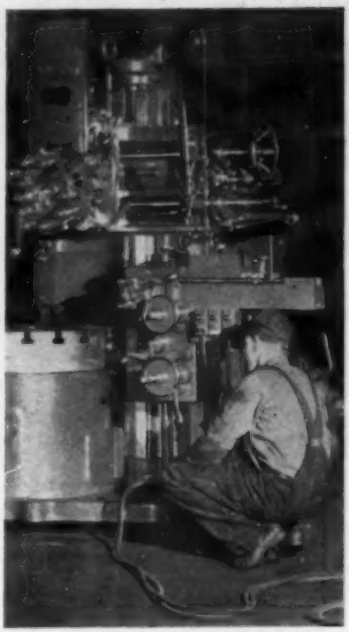
### Grinding off Rough Raised Places is Important

A good "snagging" job will pay dividends in the ultimate painting cost. When an excessively thick paint coating is required because of poor "snagging" operations, it is obvious that during the machining of those parts which have been painted before machining, the heavy coating of paint will chip at the edges. As a result more patch-up work has to be done before the final finish is applied. This increases the cost and retards production. Machine tools and parts with excessively heavy built-up thicknesses of paint are more easily marred during movement and handling within the plant.

A careful check should be made to see that the correct type of grinding wheel is used for "snagging". I have found that a cup-shaped wheel, of the proper grain and grit, will give the best results on large surfaces. The operator should be instructed in the correct method of using the grinding wheel. In many cases the "snagger" will use a motion that causes deep scratches and gouges, whereas by using a different technique this could be avoided. By eliminating the deep scratches and gouges, less spot filler will be required to obtain the desired smooth surface.

### Surface Cleanliness, Plus Correct Prime Coating

Before any priming coat is applied it is necessary for the castings to be clean. Their surfaces must be free from dirt, dust, lint, grease, oil or smudges of any foreign substance. The castings may need to be run through a degreasing machine, or a chemical washing or solvent washing operation, or possibly they may need to be cleaned by wire brushing or abrasive blasting.



Photo, courtesy of Binks Mfg. Co.

The thin prime coat applied to the bare metal must have excellent adhesion and flexibility, and it must be compatable with material to be used over it. Many times the cleaning and priming operations are slighted and as a result the final finish flakes, peels, cracks or discolors prematurely.

Paint materials should be stored in a room wherein the temperature does not fall below 60° F. Cold

*(Continued on page 61)*

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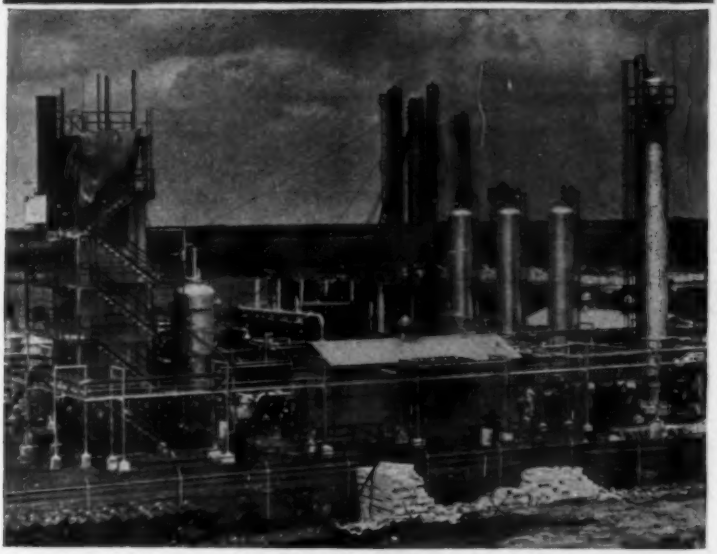

A section of the new Celanese chemical plant at Chemcel, near Bishop, Texas, showing a portion of the butadiene manufacturing equipment. Other chemicals processed at the plant include acetic acid, acetic anhydride, methanol and formaldehyde.

CELANESE CORPORATION OF AMERICA

# A BROADER BACKGROUND for Celanese Research

THE COMMISSIONING of the Celanese chemical plant near Bishop, Texas, marks an important step in the development program for the chemical division of Celanese Corporation.

Manufacture of a wide variety of basic chemicals has begun, including such versatile compounds as acetaldehyde, acetic acid, acetic anhydride, acetone, formaldehyde, methanol and butadiene.

Celanese research in the related fields of textiles, plastics and chemicals and the increasing industrial acceptance of synthetic compounds underlies this program of expansion. An even broader application of Celanese research data to specific industrial problems will be possible when full production is achieved.

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paint materials will be high in viscosity (too thick) and require excessive quantities of thinner to reduce them to a suitable working viscosity. It is much better to thin them with heat. Paint materials should be thoroughly mixed and well agitated before being used. When and if thinner must be added, it is important to use a thinner recommended by the paint manufacturer. Use the paint at a uniform viscosity which is best suited to the method of application.

It is also essential that the spray operator keep his spray gun clean. Spray guns need a real cleaning at frequent intervals. If they are dirty, proper atomization of the paint cannot be obtained—and here is one of the causes of pinholing. The spray man should be instructed as to what air pressure is to be used to properly atomize and flow the material. He should also know the proper adjustment of the gun and the correct distance the gun should be held from the work. Faulty application is one of the causes of defective paint jobs. Each stroke of the gun should overlap the previous stroke about one third the width of the spray to produce a uniformly covered surface.

A substantial saving in material and labor costs can be made, over the period of a year, if these suggestions and recommendations are followed.

Charlotte McAleer, Vice Pres. and owner of the E. J. McAleer & Co., Inc., Philadelphia, Pa., checks on progress of McAleer metal cabinet No. 1668, which was one of 3 numbers on its way through the McAleer assembly line four days after the surrender of Japan. The firm made fire bomb racks and other war items during the war.

## *Yarnall Announces Appointments to Technical Staff*

Joseph McKinley, Vice-President and Technical Director of the Yarnall Paint Co. announces the addition of F. M. McNerney and P. J. Howell to the company's laboratory staff.

Mr. McNerney has had many years experience in the protective coatings industry, with Pecora Paint Co. and The Armstrong Co. of Detroit.

Mr. Howell has been with the George D. Wetherill Co., Keystone Refining Co., and the research laboratory of the Socony-Vacuum Oil Co.

## *Standard Varnish Appoints Landon Browne*

Mr. M. H. Corbin, Vice President and Director of Sales of Standard Varnish Works, announces the appointment of Mr. Landon Browne as Technical Sales representative in Upper New York State and Northwestern Pennsylvania.

Mr. Browne has been associated with the Standard Varnish Works as a chemist in the company laboratories for many years. His appointment is in accordance with the company policy of appointing representatives who can contribute real technical advice and service to customers, which is mutually advantageous.

A

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Operating as a single unit, the Finishes Division will have the benefit of the research facilities of both Ault & Wiborg and Murphy augmented by the fundamental research program of Interchemical Corporation. It will also have a nation-wide integrated network of factories, warehouses, laboratories and service stations.

All of the famous, established products formerly sold under the names of Ault & Wiborg and Murphy will now bear the designation, "An Interchemical Finish."

Through this consolidation, Interchemical Corporation is placed in a position to give to the product finishes industry a service which in scope and experience is second to none.

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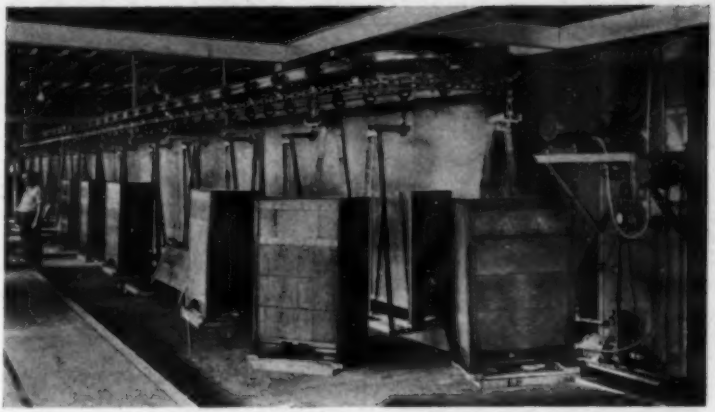

# Finishing Furniture on a Conveyor Line

**A step by step analysis of certain elements to consider when planning a conveyorized layout for finishing furniture —with adequate time allowed at each work station, followed by force drying and cooling— ending with rubbing, cleaning and final polishing.**

***BY WALTER C. ANDERSON***

MANY FURNITURE manufacturers are planning to install conveyor systems in their factories. In this change from bench work to a continuous moving chain, these newcomers are entering a new field of production. They are asking questions. They lack specific knowledge on the subject. They are interested because, where formerly it took days to finish their products, they realize that the time will soon be reduced to a matter of hours.

The conveyor line travels not only through spray booths and other various work stations, but through heated tunnels wherein the heat and relative humidity are controlled from a central heating unit. The drying time will vary for the different materials that are applied. Usually the length of time in each drying tunnel is 80 minutes. The most satisfactory results are generally obtained by using a temperature of 135° F., with a relative humidity between 35° and 42° for oil stains, wiping stains, fillers and lacquers. *(To page 66)*

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Infra-red lamps and infra-red gas ovens will play an important part in future finishes. The drying time for future materials will be shortened considerably from the scedules being used at the present time.

**Call in Conveyor Engineer For Consultation**

Starting from scratch, an engineer representing a manufacturer of conveyor systems will be called in for consultation. He will be given all of the details on what the firm plans to manufacture. If the company is in the chair business, its products will probably be made of solid woods, such as maple, birch, gum, tupelo, beech and similar species.

If the firm is making novelty furniture, such as end tables, lamp tables, coffee tables, magazine racks, etc., we can probably include solid or veneered mahogany, walnut, oak and other openpore woods. In either case, the conveyor engineer will probably specify an overhead monorail with traveling chain and hooks. Concerns that manufacture case goods will use the carrier or platform system.

The furniture manufacturer must specify his probable maximum volume of production. If he plans on expanding in the future, it is safer to set a limit in the first planning and be satisfied thereafter, in order to protect the establishment against leaner days some time in the future. Then the engineer can figure specifically on the proposed finishing conveyor.

One of the most important factors is the number of units that will be finished each day. This will help to establish the rate of speed for the conveyor to travel. It is general practice to have a furniture conveyor travel about 6-ft. to 9-ft. a minute, depending on what is being finished. Small articles can be finished faster than case goods.

The use of a conveyor system also enables the manufacturer to obtain accurate cost figures on his finishing operations. Of course, this information depends upon each hook or carrier holding a unit of furniture. In one chair factory the management figured that each empty hook meant a loss of seven cents. A case goods factory figured a loss of 80 cents for each empty carrier.

**Condition of Furniture as Finishing Operations Begin**

In the interests of high quality finishing, within reasonable time and at moderate cost, all furniture in the white should reach the finishing room in practically perfect condition. Holes, cracks, dents and torn grain should be repaired in the white, and all surfaces to be finished should be smooth and clean. This work really belongs to the cabinet department, but unless close supervision and inspection prevails all of the time, more or less of it will be passed on to the finishing department, with consequent headaches and confusion in the finishing room. Pieces with defects have to be removed from the conveyor and taken to a repair station.

Each piece of furniture should be thoroughly dusted off with an air gun to remove all sandpaper dust. If this dust is not removed it will get into some of the wet coatings and cause trouble. Where stains are applied by dipping, some of this dust will wash off into the stain tank and cause a muddy appearance on the furniture.

A competent finishing counselor should be called in to give his prac-

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tical knowledge in regard to the proper drying time for various materials, at the temperature specified, and the correct placing of spray booths. Specific finishing materials can be formulated to give perfect results—after the finishing counselor has given his company's laboratory men the floor plan and conveyor layout submitted by the conveyor engineer. Each material will have to be made to coincide with the allotted time allowed for drying. These formulated materials will work perfectly in the testing laboratory but, after samples have been submitted for testing in the factory, adjustments may have to be made. The drying tunnels will dry the various coatings, whether it is summer or winter, because drying conditions within a controlled drying tunnel need not vary.

Most of the finishing troubles occur during the period when materials are applied. In the state of Indiana and in many of the southern states, the relative humidity becomes very high at times, especially during the hot summer months. Fillers, for instance, may work perfectly in the morning but in the afternoon they may set too quickly. This means that the finisher must understand his job and add a slower drying solvent to retard the drying of his filler.

### Atmospheric Conditions May Unbalance Perfect Setup

The lacquer may set too fast. When spraying the tops of case goods last, the fine overspray that strikes at the coated ends and front may leave a coating like sprinkled sand. Reason for this is that the lacquer sprayed a moment earlier, on the ends and fronts, has already set and the fine overspray from the top does not dissolve into a wet lacquer film and flow out smoothly as it should. An expert finisher will use some retarder to slow down the rate of drying. During those humid days he may remove two gallons of lacquer from a full 55-gallon drum and add two gallons of retarder to the drum—agitating the contents thoroughly afterward. Some finishers will add as much as five gallons of retarder to a 55-gallon drum of lacquer.

When using a glazing stain for blending, the stain may become sticky and the finisher's brush will pull. This trouble can be overcome by adding a small quantity of oleum spirits or a slow naptha to make the stain work more freely. The finishing foreman should keep in touch with the finish manufacturer's service man. In this way he will absorb a great deal of knowledge and he will keep himself uptodate on what is new in finishing materials, methods and "tricks of the trade."

As the engineer of a fast passenger train speeds through the night, safely piloting his human cargo to its destination, so the finishing foreman must guide his conveyor line expertly through the finishing room. Let us get aboard his line and learn a few things that help to produce a beautiful and enduring finish. We will follow the chairs and case goods lines at the same time.

### Stains and Drying Schedules For Solid Wood Chairs

Chairs, if made of close grained woods, may be sprayed with a non-grain-raising stain in whatever color is desired. They can be sprayed with a colored or tinted lacquer toner. The solids of the latter are low, being 4% to 6%. Its purpose is to serve as a wash coat

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and base color. It also helps to seal the end wood so that a wiping stain or a thin filler, applied later, will wipe and clean more easily. Where both light and dark colored woods are used in the same piece, an equalizer will be needed. This is a pigmented lacquer, of any color desired, reduced with lacquer reducer, in the proportion of one part of lacquer to five parts of reducer—or it can be thinned more if desired. Skillful use of this material helps to make the piece uniform in color.

Following the application of these various stains, the chairs travel through a heated tunnel for 15 minutes at 125° F., and a relative humidity of 25°. I might state, at this point, that the relative humidity in the drying tunnels or rooms does not particularly affect the speed of drying. The reason for humidifying the drying atmosphere is to prevent loss of moisture in the wood. Moisture in the wood will come to a certain equilibrium during fabrication of the furniture, the amount depend-

Case goods, resting on platforms suspended from an overhead conveyor, move through lacquer spray booth. Photograph, courtesy of Palmer-Bee Company.

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ing upon the average atmospheric humidity in the factory. Then the drying tunnel should be humidified to a point which will prevent any serious loss of moisture during drying. Wood for indoor furniture should have between 6% and 7½% moisture content.

When furniture in process comes from a drying tunnel it must be allowed time to cool thoroughly, at least to room temperature, before any additional operation is started. Small pieces cool faster than case goods. The latter retain heat longer due to the drawers and larger surfaces. Drawers should be opened slightly to allow heat to escape.

If a non-grain-raising stain is used the chairs are generally wash-coated with white shellac reduced in the proportion of one part of shellac to four parts of alcohol. If lacquer sealer is used, it is reduced one part of sealer to two parts of lacquer reducer. On close-grained woods this coat is sometimes eliminated, but for open-pore woods it helps to give a better filled appearance and a cleaner surface. This coating is force-dried at the same temperature and humidity as mentioned in a previous paragraph. All wash-coated pieces should be lightly sanded.

**Wash Coat; Drying; Sanding; Dipped Wiping Stain**

Close-grained woods are either dipped by hand, or the conveyor may be bent down and up again so that the pieces will be dipped automatically into the wiping stain. A drainboard in line with the dipping tank will catch the surplus stain that drips from the dipped pieces and direct it back into the tank. In many factories the pieces of furniture are removed from the conveyor hooks and wiped clean by hand. An inspector examines each one for possible runs. He also sees to it that each hook carries a piece of furniture after leaving this operation.

If the furniture is made of close-grained woods, a colored toner or non-grain-raising stain should be used. A water stain is sometimes used but a stain of this type dries too slowly. When it is used its rate of drying can be speeded up by mixing it with either a fast-drying solvent or a mixture of shellac emulsion.

Eventually there will be stain and filler combinations that will eliminate separate stain and wash coat operations. Overnight drying fillers will be replaced with faster drying formulations to air dry in four hours or less. Due to the use of faster drying solvents, some fillers do not wipe as easily now, but this will be corrected when finish manufacturers are able to obtain suitable materials.

**Spraying Filler; Padding in; Wiping Off Excess; Drying**

Now we are entering the filler booth. It takes too long to brush on the filler, so it is reduced to spraying consistency with naphtha. Generally it is mixed in the proportion of 6 or 8-lbs. of paste filler to a gallon of naphtha. A comparatively low air pressure—possibly as little as 15-lbs.—is sufficient to spread the filler. On spray guns with which I am familiar, an E needle and fluid tip should be used.

Filling is an important operation. In order to obtain a well filled surface, soft felt blocks should be used first to pack the filler into the wood pores. I have seen men start with both hands full of tow and begin rubbing. They picked up most of the pigment and left a poorly filled sur-

Spraying sealer coat on furniture as it moves along by overhead conveyor line. Photo, courtesy Palmer-Bee Co.

face. It is important to rub across the grain of the wood with the felt blocks or tow that is used to pad the filler into the wood. Then, for the final clean up, rub carefully and gently with the grain. Here the foreman finisher must determine how many men are needed to do a real job. His final finish depends largely upon this filling operation.

Expert padding of the filler, followed by careful wiping, will save extra costs of lacquer trying to build up those tiny cavities that contain no filler. The filler will pad in much better when it is still moist, or when it has only dried to the point where it is "flattened down". One should not wait for the filler to dry white before padding it in and rubbing off the surplus. An inspector should be stationed to inspect each piece and instruct those who are inclined to cheat on the rubbing job.

Now we enter the drying tunnel in which the temperature is 135° F. and the humidity 35% to 42%. One hour and 20 minutes is required, followed by a cooling off period of 15 minutes.

**Spraying Sealer Coat; Drying; Sanding**

The sealer is sprayed on and allowed to air dry five minutes before it is subjected to force drying in the tunnel. Some concerns allow anywhere from 20 minutes to an hour for the sealer to air dry. In this case it gets no force-drying. I do not recommend the 20-minute air-drying schedule because, when varnish is the following coat, the solvents in the sealer have not entirely evaporated, and the varnish will become cloudy. If a heating oven is used, the sealer-coated work will travel for 20 minutes in a temperature of 115° F. and a relative humidity of 35%. The sealer coat is allowed to cool for 20 minutes, or to the point where the piece is warm to the touch.

The majority of finishers prefer to apply shading lacquer after the sealer has been put on and is sanded. This enables the shader to see more clearly the parts that need additional toning.

Different types of sealers are manufactured. The one generally preferred by finishers is easily sanded and creates white dust, due to the stearates used. Other finishers like a tougher sealer which ranges up to a gloss lacquer. The latter type gives better adhesion for the lacquer top coats.

The sealer-coated pieces are now sanded with No. 5/0 or 6/0 sand-

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paper which has been properly "humidified" to avoid any condition of excessive dryness and brittleness. Sandpaper can be properly conditioned by "humidifying" it for several hours or perhaps days before it is used. One way is to place several pieces of cut sandpaper on a low dry shelf or false bottom within a 5-gallon can that contains water below the shelf line or false bottom. The shelf or false bottom can be positioned 4-in. or 5-in. above the real bottom. The presence of water or moisture near but not in contact with the sandpaper will impart sufficient moisture to it to relieve any condition of excessive dryness that may have developed in storage. Of course, in many factories, this isn't necessary. The finisher's experience and natural intelligence can be relied upon to tell him whether or not his sandpaper is too dry and brittle for best results.

Some sanders use two whole sheets of sandpaper, one in each hand, especially when sanding chairs—and about half of the sandpaper is wasted. For sanding turnings and aprons on chairs, slightly used sandpaper will serve very well. With slightly used sandpaper the sander is not so likely to sand through the sharp edges or corners of stained and sealer-coated furniture. An air gun should be used to blow off the white dust, from sanding. Then the shader can either coat over the entire piece or touch up only those parts that are off color. This shading stain is fast drying. Usually it is allowed to dry for only two minutes before the lacquer coat is sprayed.

All of these spray coating operations should be performed in water-wash spray booths. The steady one-direction movement of distributed air and the continuous curtain of falling water, catches all spray fumes, thereby eliminating obnoxious odors and safeguarding the plant and workers from fire hazards. The curtain of water, falling from the top of the booth into a trough, collects and disposes of the overspray immediately. Waste paint forms a sludge that floats on top of water in the tank and this can be easily removed at regular intervals.

### The Glazing Operation; Materials and Technique

At this point, where the case goods in process are made of mahogany or other open-pore woods, a glazing or blending stain is often applied. This may be brushed on or sprayed. Of course, on a conveyor line, it is nearly always

Typical conveyor line moving through spray booth. Photo, Palmer-Bee Co.

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sprayed—at low air pressure. The stain must be formulated so that it can be wiped with ease and readily blended with a brush.

The pieces to be glazed are usually removed from the conveyor line and placed on benches fitted with rollers. Men in groups do the preliminary wiping then push the furniture forward to the next group who brush-blend the surfaces. Then comes the final inspector who may add a bit of touching up here and there. These glazed pieces enter the drying tunnel and continue therein for 80 minutes.

Some finishers spray a coat of sealer over the glazing stain, claiming that the stain, after it has dried, leaves small specks which must be sanded off. This is an extra operation and it is not necessary. Before the lacquer is sprayed, use a clean 4-in. blending brush to clean off the surface, and the following lacquer coats will flow out smoothly.

Cedar chests on platforms suspended from overhead conveyor line. Photo, courtesy of Palmer-Bee Company.

Many factories have lacquer pumped through piping from a central source to the spray booths, while others use an electric or compressed air pump which is inserted in the drum. For lacquer that has a solids content of 21% or less, I recommend using a pressure at the drum of 24-lbs. to 28-lbs. For lacquer of 27% or more of solids content, use from 30-lbs. to 40-lbs. of air pressure. A little experimenting on the part of an experienced sprayer should indicate what is the right pressure to use. Enough material should be allowed to flow, so that 50 to 55-lbs. air pressure at the gun will atomize it properly and produce a "wet coat" by spraying. The use of excessive material pressure and air pressure will cause too much material to pile up on the surface being sprayed.

### The Technique of Correct Spraying

Sometimes we see a workman spraying in an arc; in other words, he pulls the gun too far away from the work at the ends of the stroke and perhaps has the distance just right or too close along the mid-length of his stroke. This is definitely the wrong way to spray. A hand-operated spray gun should be controlled by the twisting of the operator's wrist; he should start at a distance of about 6 to 8-in. away from the surface being sprayed and follow along at that same distance, across the whole piece. In this manner he will flow on a uni-

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form wet coat of material, which is necessary. Sometimes pieces are criss-crossed or double coated, but usually this is not recommended. It piles on too much material, and causes runs or sags on vertical surfaces. Later the finish may check because of this extra thickness coating.

Sometimes case goods, such as dressers, vanities and chests, are sprayed only on the tops and fronts with the first coat of lacquer. This coat is allowed five minutes for flowing out and then the work enters a drying tunnel.

**Preheating Period Before Force Drying in Tunnel**

All drying rooms or tunnels must be arranged to provide the coated furniture a preheating period. Practically every wet film of finishing material must have a chance to "set" and get ready for the high heat of the drying tunnel. When it enters the drying room the work should not hit the maximum temperature of 135° F. immediately. Preheating prevents the trapping of air inside the film of coating material. When the coating sets up too fast, bubbles of air starting to escape through the top of the material are trapped. They have no chance to escape and allow the material to flow out smoothly afterward. Then, when the top surface is rubbed, the thin film over the trapped air will be cut off and expose tiny pockets or pock marks. After being rubbed with pumice stone these pockets will show up gray. Then the only way to eliminate the grayness is to apply a dark wax which will allow the pieces to pass inspection.

After the preheating period the coating must dry for the prescribed 80 minutes. Engineers who plan a conveyorized finishing room setup must keep this fact in mind; otherwise one coat of material will not be ready for the following coat. Lacquers are formulated for specific drying schedules and when the calculated drying time is cut short in actual production, it is difficult to reformulate a satisfactory material to do the planned job in less drying time. Here is the real cause of some disappointing finishing results—all because certain engineers who planned the conveyorized setup did not have a complete practical knowledge of correct drying procedure as it applies to wood finishing.

To shorten the time of the cooling period (following force drying) electric fans are sometimes set up to blow cool air over the pieces to prepare them for the second coat of lacquer. After the second coat has been applied, the same drying schedule is used as for the first coat. This coat should be allowed to cool off for at least 45 minutes to an hour before it is ready for rubbing.

**Different Sheens of Lacquer To Suit Kind of Furniture**

I will take time here to mention the fact that various sheens of lacquer are used for different species of woods and veneers, and in accordance with the period design of the furniture. Gloss lacquer is the highest in sheen. It requires a lot of rubbing, and every part that is hard to reach with a flat rubbing block must be rubbed with burlap, steelwool or brushed with pumice "soup" in order to kill the "shine" which would be too pronounced if those places were left untouched. Eighteenth Century groups, which are very popular, are coated with lacquers that have been reduced in sheen and are known by different numbers. Sales-

DEALERS desirous of handling Electric Sprayit Company products are asked to keep in touch with their jobber regarding expected initial delivery dates. JOBBERS who have not already placed their quantity commitments for SPRAYIT Paint Spraying Equipment are urged to do so immediately. Orders will be filled just as fast as production conditions permit, and in the order in which they are received.

SPRAYIT

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men carry sample panels of different sheens which give the number adapted for the particular type of furniture being made. These sheens do not require the amount of rubbing that gloss lacquer does. They are time savers in the rubbing room and usually give excellent results.

### Rubbing Produces Sales Appearance on Furniture

Rubbing can be performed entirely by hand, but since a number of different portable rubbing machines are on the market it is now general practice to machine-rub all or most of the flat surfaces on furniture. For the preliminary rubbing, which calls for some "heavy cutting", I suggest that the portable rubbing machine pads be covered with No. 320 or No. 360 wet-or-dry sandpaper. I also suggest that, for this preliminary rubbing, the rubbing oil (used with pumice stone) be thinned in the proportion of 60 parts of oil to 40 parts of naphtha. If straight oil is used it retards that fast cutting which is so desirable at this stage of the work. The purpose of this preliminary rubbing is to cut off any small nibs or particles that may have dried in the lacquer, and to cut down the orange peel surface which is characteristic of all lacquer films. This preliminary rubbing produces a smoother surface and saves time for the next man who will do the final polish rubbing with a similar machine, equipped with hard felt blocks.

The final rubber will use rubbing oil reduced in the proportion of three parts of oil to one part of naphtha. All flat surfaces should be rubbed with both machines. The final polish rubbing operation is especially important. The right type of pumice stone must be used. Pumice stone is graded from course to fine. The grades specified as FF or FFF are generally used for rubbing furniture finishes.

One mistake some operators make is to sprinkle an excessive amount of pumice over the surface when they start the machine. This causes the block to grind some of the pumice stone into the film of lacquer, cutting too deeply into the surface. Pumice should be used carefully and sparingly to allow only a gradual cutting down of the finished surface, while still maintaining the clearness of the lacquer film. It will take just a trifle longer to complete the rubbing job in this way, but the final result will justify the extra time that is spent.

### Sanding and Finishing Drawer Interiors

The next operation will probably be the sanding of all drawer interiors. Some finishers dry sand the drawers with No. 5/0 sandpaper, then wax them and wipe the surfaces clean with a cloth. For a smoother interior, I recommend taking a piece of waste, dip it into a thin wax and then sand the wax into the finish; then wipe clean with a cloth. This operation saves time.

Women purchasing furniture will always pull out a drawer and feel of the interior. They know that a rough interior will cause havoc with the finery of their undergarments and especially their sheer stockings. The wax used for the interiors of drawers should be lightly tinted with spirits of anis or peppermint, which will give off a sweet odor and kill the nauseating smell of naphtha.

After the finish on furniture has been rubbed, any remaining traces of oil should be carefully cleaned off. Sometimes this detail is neg-

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as go the fables about this largest of all beasts who roam in the dark jungles of India.

There's a parallel here with the label on a can of paint bearing the head of an elephant.

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lected to a certain degree, and when wax is applied and wiped off, a purple bloom shows up. Workmen who do the waxing often use a container that holds enough wax for the day's run. If the surfaces have not been cleaned of oil before waxing begins, the cloth or pad that is used to spread the wax over the surface eventually picks up some of the rubbing oil. As a result, wax and oil are mixed after contact with a few pieces.

**Remove Rubbing Oil and Pumice**

Waxes for furniture must be formulated so that the wax is not so strong that it will bite into the lacquer coating. Care should be taken to remove all traces of pumice stone from such parts as grills, carvings, mouldings, crevices, turnings, and even the backs of case goods. The pumice stone will turn white after several days. This is very noticeable when the furniture is displayed in stores, and many salesmen make it their No. 1 complaint.

It requires only a moment to remove all traces of dry pumice with a strong blast of air from an air gun. Then you will receive compliments from the retailers instead of complaints.

Synthetic varnishes will play a prominent part in future furniture finishes. I believe that an oil sealer will be used, followed with one coat of synthetic varnish. The varnish coat will be dried either at 120°F., with 36% relative humidity, during an overnight drying period, or up to 150° F. with 42% relative humidity for 1½ hours. Temperatures of over 150° F. are unsafe for wood furniture at the present time, but we do not know what will be possible in the future.

Adequate air changes in the drying room is the most important factor for the satisfactory drying of all materials. These changes depend upon the rate of input of work into the drying room. Air is a carrier of heat to the work; and the more work going through the ovens, the higher must be the rate of air change. The matter of air circulation and its distribution should be left to a competent drying room engineer. It is a question of heating efficiency in any case.

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## Packaging Exposition, April 2-5, in Atlantic City

The Packaging Exposition of 1946 will be held in the Public Auditorium, Atlantic City, N. J., April 2 to 5, inclusive, 1946. This show will be the largest in the 15-year history of the exposition, with some 150 leading manufacturers of equipment, machinery, supplies and services essential to the field of packaging, packing and shipping, participating.

Concurrently with the exposition, the American Management Association will hold a conference on packaging, packing and shipping, with outstanding authorities in the field addressing the technical sessions. An attendance of between 6000 and 7000 executives of package-using industries in the United States, Canada and Latin America is anticipated.

---

## Pittsburgh Plate Glass Co. to Acquire M. B. Suydam Co.

Plans to acquire all the voting stock of the M. B. Suydam Co., Pittsburgh, Penna., paint and varnish manufacturers, have been completed by the Pittsburgh Plate Glass Co. The transaction probably will be consummated about January 1, 1946.

According to Harry B. Higgins, president of the Pittsburgh Plate Glass Co., "The acquired company will operate as the M. B. Suydam Division of the Pittsburgh Plate Glass Co. This will widen greatly the distribution of the Suydam products and broaden the markets of Pittsburgh Plate Glass Co., since the principal products of the Suydam Co. are paints devoted to metal finishing and wire-coating, a market in which Pittsburgh Plate Glass has not been active."

R. S. Suydam, president of the M. B. Suydam Company, and his associates will continue in their present capacities, according to Mr. Higgins' announcement.

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# Air Caps and Fluid Tips

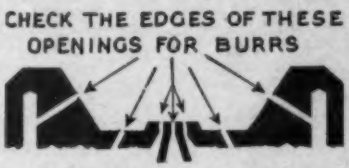
BY PETER P. WOOD

BECAUSE of the interest aroused by my article, "Spray Gun Air Caps", which appeared in Feb. 1945 issue of this magazine, I feel prompted to write a second bit of information on this subject.

Air caps for spray guns are always made of non-ferrous metals (Underwriters' requirements) to remove the hazard of sparks that could be caused by dropping the gun or striking it against something hard. Non-ferrous metals, such as brass, copper, zinc and aluminum are soft metals and are easily damaged. When holes are bored in the air cap at the time it is being made, burrs may be left at the top or outer ends of the holes. These burrs, if not removed, will distort the perfect air flow and adversely affect the spraying job.

When I refer to a burr on new air caps I don't mean something you can readily see with the naked eye. Burrs of this size are sure to be removed by the manufacturer. I refer to a burr that you would hardly find even if you used a magnifying glass. To detect these very small burrs, move your finger nail over each hole, at right angles to the hole. Move your nail across the hole, applying very light pressure to the finger nail. If there is a burr your finger nail will detect it at once. Do this from various angles around the hole.

During the rush of war work more imperfect caps were delivered to customers than in normal peace time. We can fully understand this, but where high quality finishes are a problem, the spray operator must have perfect air caps.




PARTIAL C.S. OF AIR CAP

To remove any small burr from an imperfect air cap, one must know what he is doing, as the cap can be spoiled before a gallon of paint has been sprayed through it.

**How to Safely Remove "Invisible" Burrs**

To remove any small burr from the drilled hole in an air cap, I recommend using a hardwood stick and jeweler's rouge. Hold and rotate the stick so it is always parallel to the center line of the hole. Or, if it is available, use a very

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CURVED ARROWS SHOW TURBULANCE OF AIR WHICH CAUSES PAINT TO BUILD UP ON SOME AREAS OF AIR CAP.

fine stone pencil which is rounded at one end and pointed at the other. If a stone is used, one should take extra precautions to make sure that the center line of the pencil is in line with the center line of the drilled hole. First use the rounded end. Rotate the stone "pencil" without applying any pressure; rotate it slowly with the fingers one or two times. Next, turn the stone and use the point. Insert it in the hole and repeat the operation. This treatment, if performed skillfully, will remove the burr at the top and the point will clean up any burr that may be turned inside the hole.

**Be Sure You Have a Clean Unmarred Fluid Tip**

At the center hole around the fluid tip, you will notice that a miniature "platform" or "stage" has been made. The relation of this top surface to the end of the fluid tip is very important; it can change the cap from suction or syphon to a full back pressure. This surface should always be clean and smooth—never marred with indentations, scratches or paint film.

The center hole is important and should be in perfect shape and condition. To demonstrate how important these surfaces are, I suggest that you take a discarded cap and nick the top edge of the center hole with a screw driver or chisel. Then spray one pattern on a piece of clean paper, holding the gun 6 to 8-in. away and pointing it at right angles to the flat surface of the paper. Then try marring other holes. Watch the spray pattern change shape. Notice how the distribution of spray is affected by marring different holes in the air cap.

After trying the experiment just described, you can readily understand why paint that builds up on the face of the cap creates trouble; it results in poor painting and rejects.

**Why Paint Builds up On Air Caps**

What causes paint to build up on air caps while the operator is spraying? This is a fair question, but rather hard to answer without having a service man present to detect the cause. However I will try to give you a few basic reasons.

From the holes on an air cap, high pressure air is ejected. By high pressure air I refer to compressed air. These columns or jets of compressed air travel at high velocity; they are directed to a definite point to do specific work, but from the hole to the point of work (the surface being spray painted) the air expands rapidly. In their travel, the jets of compressed air set up other currents of air, creating a turbulance.

To demonstrate what I mean, blow some tobacco smoke into quiet air; then take an air gun, get the nozzle into the smoke and turn on the air. The ⅛-in. jet of high velocity air, when turned on, will move the smoke in the air along the flow of expanding air. This very action takes place around each jet of air as it comes from the

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spray gun air caps. Being very close to the point of contact of the air and fluid, the air currents pick up particles of wet paint and deposit some of them on the air cap. This may be caused from several things, such as burrs on the cap, a damaged cap, too high atomizing pressure, distorted air holes, paint thinned too much or not reduced enough, using too large a fluid tip, or using the wrong cap for the paint being sprayed.

This condition has been relieved by manufacturers, but the cure is as bad as the disease because the volume of air required is about equal to the amount of air employed to make the pattern. I might explain that all spray gun air caps will collect some paint, due to paint particles moving in the air where the spray painting is going on.

**How to Keep Spray Gun Air Caps Clean**

My suggestion, to those who have this trouble to a serious extent, is to first make sure that the fluid tip is not too large (.04 to .05-in.); that the air cap is in good condition, that atomizing pressures are at the lowest point possible, and that the fluid tip is in perfect condition.

If all of these things have been taken care of, and if you still have

PRESSURE FEED
FLUID TIP SHOULD BE NEARLY FLUSH WITH AIR CAP. WHEN LOWER THAN ABOUT .002 IN. BACK PRESSURE DEVELOPS.

CROSS SECTION OF FLUID TIP WITH SHARP CORNERS (A) AND WITH ROUNDED CORNERS (B).

SUCTION FEED
(FLUID TIP PROJECTS BEYOND AIR CAP)

trouble, I recommend that you have two caps for each spray gun, so that you can change to a clean one frequently. An easy way to let the removed air cap practically clean itself is to place it on the submerged screen of a small container solvent. When one cap becomes dirty, remove it and allow it to soak. Alternate the use of the two caps during spray operations. Consult your manufacturer's representative; he should be a lot of help. He may recommend another air cap for your work.

Air caps are built to do certain work and while you may use a certain make of 7-hole cap, the placement of the holes may be entirely different in another 7-hole cap; and the inside of the cap may be designed differently. Pick up some of the air caps you have around and look at their construction inside. Each one has its own characteristics for very definite reasons. It is not necessary to go into why they are different, but remember that the inside of the cap is just as important to keep clean and free from burrs as the outside. *(Continued on page 96)*

# SPEED UP DELIVERIES

## —USE LACQUER

LACQUER finishing saves DAYS in getting products to dealers and customers . . . because it air-dries in minutes and the products finished today can be shipped today. If you are losing valuable time in your finishing department, check with a lacquer supplier at once—and switch to lacquer.

*C.S.C. makes no lacquers or thinners but supplies solvents and plasticizers to manufacturers of protective coatings.*

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**Characteristics of Different Fluid Tips**

Fluid tips are just as important as the air caps. In my previous article I mentioned only diameters (inside and outside) but there are other things to know about them. Some fluid tips have a flat face with sharp corners around the outer edge; others have flat faces with slightly rounded corners around the outer edge; still others have almost fully rounded faces. Some have a straight-walled fluid orifice, while others have a tapered fluid orifice. Each is for a purpose.

Fluid tips are made of various kinds of metal—aluminum, brass, cold-rolled tool steel, stainless steel, and even cemented carbide inserts are used. What the new alloys will do to help remains to be seen. Most of the fluid tips used in factories are of one class, so you only have to order by number to get the right kind. The ones chiefly used are the "flat face", and the flat face with the sharp outer edge removed. The important thing is to make sure that the tip end is free from tool marks, burrs and heavy scratches.

Be sure that you are not using a fluid tip that is too large. Many spray men seem to believe that the size of this hole from which the paint comes is what gives production speed. This is absolutely wrong. *The speed of spraying is dependent upon the fluid tank pressure.* More paint will flow out of an .04-in. hole at 20-lb. pressure than will come from an .07-in. hole at 5-lb. pressure. The results from using the .04-in. tip will far surpass the results obtained from the .07-in. tip. The reasons are obvious if you will but realize that the small column of air can wholly envelope the small column of fluid and keep the fluid under control, whereas it would have difficulty in enveloping the large column and keeping it under control.

I only wish that each foreman and spray painter would stop long enough to reason out the points revealed in this article in his own way, using sound logic. The conclusion would be beneficial to himself and his company.

Correct adjustment, always important.

## *Smith-Corwin, Inc., Expands*

Smith-Corwin, Inc. (Paints, Varnishes, Lacquers), Irvington 11, N. J., announces that property has been purchased at 125 S. 20th St., giving the company 6000-sq ft. of manufacturing space, and 14,000-sq.ft. upon which plans are underway for new construction. This has been brought about because of sales and production demands beyond present facilities.

Export offices have been opened in New York, N. Y., at 66 Leonard St., and Mr. Norman S. Slowey has been appointed as Export Manager.

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**HIGHER SOLIDS**
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*For wood finishing, we offer:*

**20-501 CLEAR WOOD LACQUER**
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**20-100 SANDING SEALER**

Extreme ease of application. So balanced, they do not sag on vertical surfaces. Formulated for maximum solids contents—whether sprayed, dipped or tumbled.

20-100 SANDING SEALER—dries quickly. Sands easily without gumming up paper. Produces smooth, hard surface for top coat application.

20-501 CLEAR WOOD LACQUER—Its high quality solids content makes possible rapid, non-sagging application. Produces a high gloss, durable, mirror-like surface. Can also be used to produce a gloss finish in one coat direct on wood without use of sealer, where this type of finish is desired.

It will be well worth your while to try these two lacquers in comparison with what you are now using. Write for samples NOW—while you are thinking about it.

**Note:** *When writing advise us what article is to be finished. Quality and type of finish required. Method of application. If possible —send sample of unfinished piece and sample of finish desired.*

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# Letters from Readers

## Expert Striper on Canvas

On page 98, in the October 1945 issue of INDUSTRIAL FINISHING, I notice an item entitled "Color Stripes on Canvas," by S. V. Co. As I have had 15 years experience in the painting of awning stripes, I would like to get in touch with S. V. Co., since they seem to be considering the painting of awnings. I might be of some help to them.—Ed. L. Molineaux.

Okay Ed.; we are sending to you, by letter, the full name and address of S. V. Co.—ED.

## Fungicide Coatings Article

I have been requested to obtain three copies of the article, "Fungicide Coatings in War and Peace," as published in the May 1945 issue of INDUSTRIAL FINISHING. Do you have three reprints of this article that you could send to us? — Librarian at R. F. Co.

We have no reprints, but are sending you tear sheets from old copies of the magazine.—ED.

## Whose Portable Sander?

We are very much interested in one of the letters that appeared on page 94 of your September issue, under the name of "Sander; Burner; Striper." We are particularly concerned with the statement that "he has been using one made here in Chicago but it is not very efficient."

Our Sterling Sanders are used so extensively in the automobile paint and body shops that we can not help but wonder if the writer of that letter is referring to one of our machines; if so, we suspect that he is not getting full use of our machine. If this is the case, we naturally would like to have the opportunity of demonstrating our sander to him on automobile body work.—Sterling Tool Products Co.

The individual in question is in Chicago, and we are giving you his name and address in a letter.—ED.

## No More Smith Dipping Machines

With reference to your letter regarding dipping machines, we discontinued the manufacture of these machines several years ago and do not propose to again manufacture this equipment.

The demand for dipping machines fell off at that time in favor of conveyor dipping equipment and we believe that the conveyor dipping method is superior to the old style dipping machines.

We do not know of anyone building dipping machines now, although there seems to be a demand for these machines at the present time.—Bignell Machine Co. (Successor to C. W. Smith, M.E.)

## Screen Stencil Information

Having read your article on Stencil Screen Process by H. L. Hiett, appearing in the November 1945 issue of INDUSTRIAL FINISHING Magazine, I would appreciate any information you can give me as to where to obtain the books on complete silk screening by the above author.—H.A.T. (Decorative Boxes & Displays).

We are referring your letter to Mr. Hiett in Chicago.—ED.

We wish to find the address of some one who makes silk screens for use in stenciling designs on furniture.—B. W. Co.

We suggest that you try one of the following:

The Sherwin-Williams Co., Cleveland 1, Ohio.

Naz-Dar Co., Chicago 10, Ill.

Prairie State Products Co., Chicago 16, Ill.

Screen Process Co., Indianapolis 4.

## Hot Lacquer Spraying

On page 86 of your issue of December 1944, you show a picture of a hot lacquer spraying unit, or the cabinet housing most of the unit. In the accompanying article you refer to the "Thermotite" system. I'd like to get all the information I can regarding the unit illustrated also about the Thermotite installation.

One of my accounts now using hot lacquer is handicapped by inability to

# The GUARDSMAN Research Laboratories

Furniture makers are being invited to consider the facilities of THE GUARDSMAN RESEARCH LABORATORIES, completely equipped with the newest type production spray equipment, steam and electric ovens, electric infra-red lamps, gas fired and gas infra-red ovens, electric sanders. These facilities—now being carried on for individual research for furniture finishes—are directed by THE GUARDSMAN TECHNICAL STAFF of graduate chemists and technological experts.

Your Customers will be looking for

**Guardsman Finish**

*an exclusive product of*

**Guardsman**
**A Beautiful Finish**
Highly resistant to: boiling water, hot dishes, scratches, mars . . . alcoholic beverages.
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GRAND RAPIDS, MICH.

**GRAND RAPIDS VARNISH CORPORATION**
GRAND RAPIDS, MICHIGAN

get a pump heavy enough to keep his lacquer circulating properly. If you know of any one making pumps of heavy enough duty to do this operation, I'd like their names.—G.T.S.

The article and picture to which you refer came from Lowe Brothers Co., Dayton F2, Ohio.

For circulating pumps, we refer you to manufacturers of spray equipment who advertise in this magazine.—ED.

## Knife Coating Machines

We would appreciate your sending us any information that you might have in regard to the manufacture of knife coating machines. — P. T. Co. (Tile Board.)

We assume that you have in mind the "doctor blade" type of coating machine, wherein perfectly flat sheet stock (or flat panels, strips or slats) of uniform smoothness and thickness is caused to pass horizontally under an adjustable steel blade while a flow of paint or other coating material spreads out over the top surface of the stock —at one side of the knife. The doctor blade is positioned at right angles to the direction the stock is traveling, and it is adjusted down close to the top surface of the stock so that as the stock passes under the knife's straight level edge, all but a thin uniform film of the flowed-on paint or other coating material is held back or scraped off. We do not know how extensively this method of coating is used, nor do we know where such coating machines can be purchased. Can some reader tell us something about this?—ED.

## Custom Finishing

We are interested in contacting someone who can apply a flexible high-gloss coating on ½-in. and 1-in. webbing for use on baby safety straps. We have found concerns able to coat wide goods, but no one seems to be in a position to do the work on narrow widths. Please advise.—Dan-Dee Strap & Specialty Co., Brooklyn 11, N. Y.

Will some reader suggest a concern who is equipped for, or who might be interested in, doing some of this type of finishing?—ED.

## Conveyor Manufacturers

We have a request from Plymold Corp. of Lawrence, Mass., for a list of names of conveyor manufacturers who would be in a position to completely engineer and install conveyor systems for their new plants, which will approximate 750,000-sq.-ft. If you will be good enough to write them, giving this information, it will be greatly appreciated.—D. & Co.

Some advertisers in INDUSTRIAL FINISHING can probably handle this assignment, for instance:

Davidson Engineering Service, Box 2941, Winston-Salem, N. C.

Jensen Specialties, Inc., 9331 Freeland Ave., Detroit 27, Mich.

## Hot Lacquer; Infra-Red

We desire to obtain full and up-to-date information on American methods of furniture finishing, particularly with: a) hot lacquer, b) infra-red. We will be pleased to learn if you can put us in touch with a consultant capable of letting us have the required information.—F. E. & Co., London, England.

In a letter we are giving you names and addresses of concerns who can supply what you want. All are advertisers in this publication.—ED.

## From Aleppo, Syria

Will you kindly send me the names and addresses of manufacturers making tumblers for tumble finishing, and dipping machines?

I wish also to know who sells paint or lacquer for dipping and tumbling.

Please send me a copy of the article "Tumble Finishing." I'm manufacturing wooden toys, handles, novelties, etc. in quantities.—Dikran Maybalian, Bab-el-Assab, Aleppo, Syria.

For tumbling barrels try:

The United States Stoneware Co., New York 17, N. Y.

Lupomatic Tumbling Machine Co., New York 66, N. Y.

For dipping machines, try:

Apex Products Corp., 53 E. 10th St., New York 11, N. Y.

For paint or lacquer to be applied by dipping and tumbling, contact any of the manufacturers whose advertisements appear in this magazine.

A reprint of an article about tumble finishing is being sent you.—ED.

## Electrostatic Detearing

One of our customers is interested in information regarding the method of electrically detearing of paint on dipped work (removing the clinging tear drops of paint that hang from the lowest edges or corners of dip-coated articles.)

It is our recollection that information on this subject has appeared at

# I Weigh the Difference

between a product that has luster and beauty against one with a dull, unflattering appearance. There's little similarity in their sales-appeal.

No matter how graceful a product might seem, it needs an artistic finish to enhance its design. If you are having a decorative problem, we are equipped to create the proper finish to make your product stand out and stimulate a buying desire in the prospective customer.

Let our Creative Studio conceive an attention arresting finish for your wood or metal products. We invite reputable firms to consult us without cost or obligation.

*No Tampering with Quality*

ROCKFORD VARNISH *Company*

ROCKFORD, ILLINOIS

*Manufacturers of Protective and Decorative Coatings*

times in previous issues of your magazine. Would it be possible for you to tell us in what issues such articles might have appeared, or where else we might get such information?—X. Co. (Paint Manufacturer.)

Articles on this subject appeared in the following issues of INDUSTRIAL FINISHING Magazine: Dec. 1940; Sept. 1943; July 1944; Sept. 1945. The manufacturer of the equipment is Harper J. Ransburg (Electric Coating Div'n.), 1334 Barth Ave., Indianapolis 7, Ind.—ED.

## To Make Blond Oak

Will you advise me what treatment to use and the materials, manufacturer of same, etc., to get a bleached blond oak? We manufacture modern oak furniture and have a demand for blond oak. So far, we have had no success and would appreciate your technical advice and where the necessary materials may be purchased.—A.C.H.

See the Question & Answer Dept. of this issue.

Most of the manufacturers of wood finishing materials who advertise in this magazine can supply you with bleaching materials and the directions for using same. However, in a letter we are naming several who we know do supply bleaching materials for use in taking the color out of wood, previous to finishing.—ED.

## Flock Finishing

We want to use flock on beaver board and masonite, plus the figures that need to be flocked. In our religious teaching, we utilize the adhesive qualities of flannel or duvella, and back the paper colored Bible figures, etc., with the same and the teacher uses this in her visual teaching. Now that flannel is scarce, we want to flock the board and figures.

We'd like to get the names of all flock producers, and the adhesives that will work best on the materials indicated above. We realize that this is a large request, but we can't seem to get the right data from any other reliable source.

We do have small samples of some brands of flock adhesive. The question of the flock is vital in our item, as we need to have the type that will hold flannel, duvella, blotter, sandpaper and flock. We mention these, as many different teachers use some of these from time to time. At present we've found that the rayon flock will not hold the blotter type figures. This is bad for us, as we have thousands of printed stories on blotter.

You may be able to suggest the length of the flock, too. We trust that you get the idea we utilize in our visual approach. Flannel is backed to flannel to tell the Bible stories. Now that flannel is rare, we want to substitute flock for the board (28x40-in.) and the paper stories, with colored figures.

Any information and help you can give in the solution of the problem will be much appreciated.—C. P. I.

Manufacturers of flock and the adhesives for same advertise in this magazine. In a letter we are naming those we know who do manufacture or supply such materials. Also, we are sending you tear sheets of articles previously published in I. F. about the use of flock. Can any reader supply additional suggestions or information?—ED.

## Buffing Wheels

Would you have any knowledge of where we could purchase buffing wheels built to polish Venetian blind slats, after waxing, and to remove overspray? We will appreciate any help you may be able to extend.—A Venetian Shade Co.

Try The Lea Mfg. Co., Waterbury 86, Conn.—ED.

## *Mexican Business Outlook*

The outlook for American business south of the border is brighter than it has been for some years and the general attitude toward American products seems friendlier, according to M. L. Langel, head of the export department of the Brush Division of The Osborn Mfg. Co., Cleveland, Ohio.

## *W. B. Roberts Advanced by Aluminum Co.*

The Aluminum Co. of America, Pittsburgh 19, Penna., announces the appointment of W. B. Roberts as manager of the Company's Albron pigment division.

A native of Indiana and a graduate of Purdue University, Mr. Roberts began his aluminum career at Alcoa's Badin, N. C. Works in 1923. He was transferred to the Company's Research Laboratories at New Kensington, Penna., in 1924 to work on the development of aluminum paints. Later he was transferred to the Pittsburgh sales department as the company's first full time aluminum pigment salesman.

In 1928 he was appointed assistant Sales Manager in the aluminum pigment division, which position he has held, up to the time of his present promotion.

# *Season's Greetings*

**With many of our friends returning to their civilian activities, it is particularly appropriate in this year of victory to extend to all our friends, our best wishes for a Merry Christmas and a New Year of Peace, Happiness and Prosperity.**

*Beckwith-Chandler Co.*

NEWARK 5, N. J.

# Questions and Answers

## Finishing Maple and Oak In Blond Color

I am interested in getting specific practical information about how to finish hard rock maple, both in maple color and blond. Also, how to finish white and red oak to look like blond mahogany.—C.J.H.

---

Hard maple can be finished in the typical maple color by several different methods. Here are a few:

1) Use a maple N.G.R. stain; apply a full wet coat. When the surface is thoroughly dry, apply clear lacquer sealer. Let dry. Then sand lightly with fine sandpaper and finish with one or two clear lacquer top coats.

2) Take a maple N.G.R. stain and use it as a toner. Spray it on lightly, not too wet but more to uniform the color of the wood. Next, apply a coat of maple pigment stain. Wipe clean and let dry. Then follow with sealer coat, drying, fine sanding, and the one or two top finish coats.

3) Coat the wood surfaces with maple pigment stain. Wipe dry and allow time for the surface to dry thoroughly. Spray sealer coat; let dry; sand lightly with fine sandpaper; shade with lacquer shader or maple color; apply top finish coats.

4) Coat the wood surface with maple pigment stain. Wipe and let dry. Use a sealer tinted to maple color. Sand lightly, being careful to avoid cutting through at corners and edges. Apply the top finish coats.

To produce the blond finish on maple, there are different methods of arriving at the desired result too. For example:

Bleach the wood with a mixture made up of two parts of No. 2 bleaching solution, to one part of No. 1 bleaching solution. Apply wet over entire piece, (with sponge or cloth) being sure to wear rubber gloves for protection of the hands. The action of the bleaching solution should be neutralized with a clear water rinse, or a rinse to which has been added a small quantity of ordinary vinegar. Wipe the rinse water over the piece and let dry. (Where time is not an item, and the bleached piece can be left for 72 hours before finishing, it is unnecessary to use rinse.) Sand lightly to a smooth surface and spray on a coat of clear lacquer sealer. When dry, sand lightly with fine sandpaper and follow with one or two finish coats of clear lacquer.

Following is another method:

Instead of bleaching out the color, subdue it by skillful tinting with white or near white in the lacquer sealer. Use a clear lacquer sealer to which has been added a small quantity of white or ivory or cream-colored lacquer enamel, depending on the degree of blondness required or desired on the finished product. Be careful to avoid using too much of the color, as that would give the piece a painted effect which is undesirable. When properly formulated and

# Save Production Time and Material . . . Increase Production Profits with

CHADELOID STAINS

NON-RAISING • NON-GRAIN-RAISING • COLOR-TRUE

CERTIFIED

**Our licensees' customers report savings up to 40% with Chadeloid Stains, which conserve time and materials . . . cut down production operations . . . and help convert sap wood into products which compare favorably in appearance with those manufactured from the finest woods. For additional information, just get in touch with one of the Chadeloid licensed manufacturers listed below:**

Adams & Elting Company
Advance Paint Company
American Paint Works
Atlantic Lacquer Mfg. Co.
Atlas Powder Company
Ault & Wiborg, Div. Interchem. Corp.
Bigelow Varnish Company
Billings-Chapin Company
T. L. Blood & Company
Boston Varnish Company
Andrew Brown Co., Inc.
A. C. Buschman & Company
Campbell Paint & Varnish Co.
Carosel Chemical Company
Carpenter-Morton Company
Chicago Bronze & Color Works
Clover Leaf Paint & Varnish Co.
The H. B. Davis Company
Flood & Conklin Company
Forest City Paint & Varnish Co.
The Foy Paint Company
W. P. Fuller & Company
The Glidden Company
C. W. Haynes Laboratories, Inc.
Heath & Milligan Mfg. Company
Heath & Milligan Mfg. Co. (Cal.)
A. C. Horn Co., Inc.
India Paint & Lacquer Company
Mears & Waldstein Company
Murphy Finishes Corp.
Murphy Paint Company, Ltd.
Newark Varnish Works
N. Y. Woodfinishers' Supp. Co., Inc.
Nubian Paint & Varnish Company
Palmer-Price Company
Penfound Varnish Co., Ltd.
Perfection Paint & Color Co.
Rockford Varnish Company
Carlos R. Rossi
Rosolin Flexible Finishes, Inc.
Schaefer Varnish Company
Scriver & Quine, Inc.
The E. J. Shannon Company
R. H. Thorpe Paint Company
Trojan Lacquer Company
Twin City Varnish Company
U. S. Lacquer & Chemical Co.
L. R. Van Allen Company
Wabash Products Company
The A. Wilhelm Company
John H. Witte & Sons
Woodfinishing Products Co.
Zapon Division, Atlas Powder Co.

## CHADELOID CORPORATION

308 W. FIRST ST. • DAYTON 2, OHIO

*Patentees and Licensors*

U. S. PATENTS — 1,877,748 — 1,898,247 — 1,930,768 — 1,977,345 — 2,000,120 — 2,000,121 2,093,424 — 2,105,984 — 2,161,503 .

skillfully used, this blond sealer will impart to maple a nice looking blond finish. Following the sealer coat, sand lightly with fine sandpaper and apply finishing coats of clear lacquer.

Still another method of getting the same effect, but a little different, is as follows:

Seal with clear lacquer sealer. Sand smoothly with fine sandpaper. Apply a coat of color-tinted blond lacquer finish, followed by a coat of clear lacquer. This will give a uniform blond effect and there is no danger of sanding through the colored sealer, as in the method previously recommended.

As to finishing white and red oak to simulate blond mahogany, I believe that you have in mind the straw, wheat or harvest finishes which are popular now. You can get all of these finishes on oak, but you will still have the characteristic oak grain. You can't hide that. To finish oak in these finishes it is necessary to bleach the wood first and then proceed to get your desired color with light tinted stains and fillers matched to whatever color you select. Oak, properly bleached and colored in the lighter tones, reveals a beautiful finish. However, it can never appear like mahogany because of the distinctively different grain in the two woods.—E. HOGSTROM.

## Correction in Nov. Ad of United Lacquer Mfg. Co.

A serious error in figures occurred in the advertisement of United Lacquer Mfg. Co., Linden, N. J., which appeared in November 1945 issue, page 35. The baking schedule for the company's Flo-Bak Synthetic Baking Enamel was incorrectly given in bold-face type as "300° for 45 minutes." It should read "300° for 10 minutes." Naturally this makes a tremendous difference to users and prospective users of a baking enamel. INDUSTRIAL FINISHING regrets letting this obvious error get through.

## What Is "Melamine"

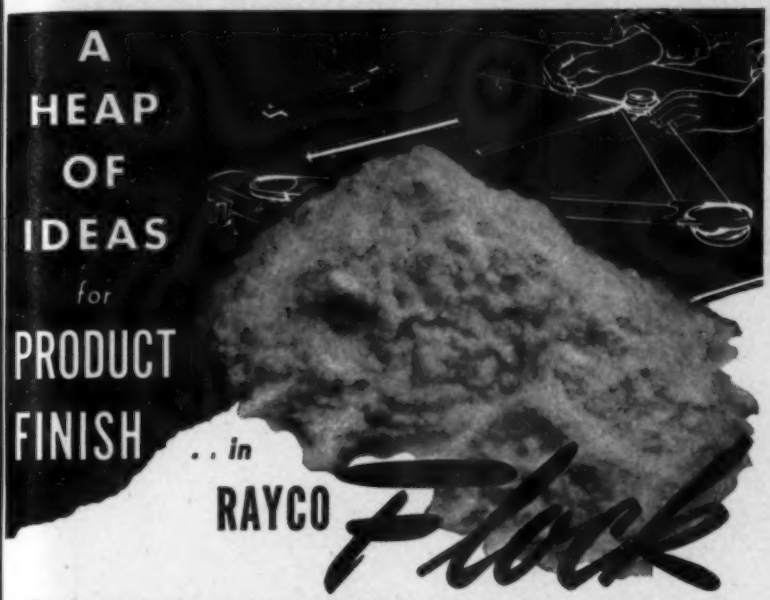
**Please give me some information about "Melamine," as related to finishing materials.**

Melamine is a chemical which is produced synthetically. A 24-page booklet entitled, "Melamine," contains many colorful illustrations, along with information about melamine, its development and its uses in various industries, including the paint, varnish, lacquer and enamel field. A copy of this booklet can be obtained by writing the American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y.

Quoting from the booklet, "Melmac resins — resins made from melamine—were first incorporated into quality surface coatings as far back as 1939, and since that time have found rapidly expanding use. They have made possible the production of enamels that surpassed anything yet achieved in hardness, resistance to impact, abrasion, scratching, and the destructive action of fruit acids, foods and greases. The refrigerator so finished will retain its original whiteness and glossy appearance through long years of service.

"The finish on the various parts of the kitchen stove requires virtually the same characteristics as that on a refrigerator—plus resistance to high temperatures. Melmac resins have provided all of these features and in addition, a degree of resistance to impact and bending that could not be obtained with the porcelain type enamels previously used.

"On washing machines, too, these resins provide an almost indestructible finish that withstands the effects of hot water, alkaline soaps, and the wear and tear of countless launderings."




The coating of surfaces with Rayco Flock has infinite possibilities in product design—as indicated by the suggestive Functional and Decorative lists below. These textile or hair particles can be permanently adhered to any surface, either over-all or selected areas. Application can be at any stage of fabrication of a component or complete product. Inform yourself about Flock's possibilities with relation to your field of manufacture.

| FUNCTIONAL | DECORATIVE |
|---|---|
| Used in the auto, airplane, radio, electrical, phonograph, ceramics, furniture and many other industries for surfacing all sorts of materials to provide— | Applied in various lengths and colors to wood, paper, cloth, metal, etc., the following effects are produced— |
| SOUND DEADENING • TEMPERATURE INSULATION • INTEGRAL GASKETS • SHOCK ABSORBING SURFACE • NON-MAR SURFACE PROTECTION. | SUEDE LEATHER • FURNITURE UPHOLSTERY • INTERIOR AND DRAPERY FABRICS • VELVET • VELOUR • MOHAIR. |

*Engineering Information, Prices and Samples Upon Request.*

**RAYON PROCESSING CO.** of R.I. INC.

58 TREMONT ST., CENTRAL FALLS, RHODE ISLAND

*Developers and Manufacturers of Printing and Coating Flock*

## Random Comment on the Industrial Scene

*(Continued from page 10)*

fitted with a black reflector, is used to activate the paint.

One interesting sidelight in this report from Russia concerns a hospital whose windows were destroyed in a bombing raid early in 1942. Although the paint was subjected to extreme weather conditions throughout the war, the walls continued to glow when inspected a few months ago.

* * *

**Holding The Line**—Despite the fact that many cost factors have increased sharply since 1941, Westinghouse intends to distribute its line of household appliances at their last prewar levels. The firm contends that this decision was made as its contribution to the fight against dangerous inflationary trends.

In announcing the move, J. H. Ashbaugh, vice-president of Westinghouse, adds a note of caution: "This policy can only continue if, after a period of production experience, it is found that labor, materials and other cost factors make a reasonable profit margin a possibility."

* * *

**Expansion in Plastics**—Some of the enthusiastic boosters of plastics maintain that the field will soon become a billion-dollar industry. This prediction is made, despite the fact that total dollar volume of American plastics manufacturers increased 325% during the war.

According to W. S. Landes, president of the Plastics Materials Manufacturers' Association, an additional growth of 25% is feasible in the near future. An important reason for his optimism is the constantly increasing use of plastics in electronic heating, plus an enormous demand in such fields as automobiles and building.

However, Landes is not among the crystal-gazers who foresee plastic homes and plastic automobiles the day after tomorrow. On the other hand, he points out that many pre-war cars contained as little as 2-lbs. of plastics. If the figure were increased to only ten or 20-lbs. per unit, that would involve a staggering market.

* * *

**For Visitors**—Readers of INDUSTRIAL FINISHING are reminded that free tickets to many leading radio broadcasts are obtainable on request. When planning a visit to Manhattan, drop a line to: *Lawrence H. Singer, 130 West 86 Street, New York 24, N. Y.* Among the cooperating sponsors are:

Nash Kelvinator (Andrew Sisters Show); Lehn and Fink Corp. ("Blind Date"), and B. F. Goodrich Co. ("Detect and Collect").

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## Black Letters on White or White on Black

LONG STANDING differences of opinion regarding the relative legibility of black numerals on a white background and white numerals on a black background, on auto license plates, has resulted in some interesting findings by Dr. Curt Berger of Cornell University. The Associated Press reports that Dr. Berger has designed numerals giving up to 40% better legibility than current license plates. He did this by narrowing the width of stroke, that is, width of the line that forms the numerals, and adjusting the spacing between the strokes.

After more than 12,000 experiments, Dr. Berger found that for

BAKING ENAMELS
LACQUERS
ENAMELS
SEALERS
PRIMERS

NEW PERIOD
WOOD and METAL
FINISHES

SYNTHETICS
VARNISHES
SHELLAC
FILLERS
STAINS
SUPPLIES

*Season's Greetings*

At this time of the year we pause to extend our best wishes for a Merry Christmas and a Happy New Year to all our friends and customers whose friendship and good will we have enjoyed and for which we are grateful.

☆ ☆ ☆ ☆

NEW PERIOD PRODUCTION FINISHES

NEW YORK WOOD FINISHERS SUPPLY CO., INC.
105 DELAY STREET BROOKLYN, N. Y.
Established 1917

a single numeral standing by itself, white on black is 10% more legible than black on white. A black numeral has to be of wider line than a white numeral to achieve comparable legibility. But this superiority does not hold when a group of numerals is put on a license plate. A group of black numerals on white becomes as legible as a group of white numerals on black, when the total width and spacing of the black figures have been correctly adjusted. However, it is concluded that "*White on black probably gets the nod*" as best, because it is possible to raise the visibility about 9% by placing a rectangular white border around the edge of the license plate, but only if the width of the border line is the same width as the line of the numerals.—N. P. V. & L. Association.

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## Beautiful Mansion is "Proving Ground" for New Finishes

Something new in the way of a permanent show place wherein people can see the results of using various finishing materials on fine interior woodwork, furniture, antiques, etc., is announced by Mr. E. W. Hagadorn, President of Finishine Laboratories, Inc., Syracuse 4, N. Y. Mr. Hagadorn purchased a beautiful mansion and has had it attractively furnished with appropriate furniture, antiques, and chinaware. The surfaces of everything have been restored to perfect condition and appearance by using Finishine Laboratories' finish and repair materials in accordance with methods prescribed by the company.

"Old English Manor." Visitors welcome.

Mr. Hagadorn, rightfully proud of the place, has named it "Old English Manor," and states that it is to be a testing station and proving ground for Finishine Laboratories, Inc., the same as General Motors has a proving ground and testing laboratories for the promulgation as well as the improvement of their products.

Quoting further from Mr. Hagadorn's announcement:

"All of the many thousands of dollars worth of rare antiques have been finished with different Finishine Laboratories, Inc., products from different types of shellac gums cut with our anhydrous alcohol, to our padding processes such as the Lubrisol Pad-O-Paque process. All defects in wood have been repaired with our famous Lacstix and other types of stix, depending on the finish that was used on the antique. In addition to this, the entire interior has been finished with different parts of our preparation.

"We have applied the Lubrisol Pad-O-Paque process for finishing the interior woodwork; our waxes have been applied on the floor; our shellacs have been used for base coats, and our varnishes have been used on some parts of the trim and floors. In fact all such items as stains, protective coatings and all other items of our manufacture have been used as experimental processes when and where we could find an opportunity to test our products.

"In addition to that, all of the fine Dresden and china the writer possesses has been and is in the course of being repaired with our burning-in stix, and our plastic cements. We have now learned to repair china in such a perfect manner that we are just about ready to announce a repair kit especially for the ceramic trade.

"Naturally, too, as well as 'Old English Manor' being a proving and testing ground, it is going to serve as our show room for out-of-town customers who choose to visit it when in the vicinity, or for special trips.

"We will conduct finishing classes for our particular trade, gratis, for those who care to attend. We believe there are many thousands of finishers who wish to be taught additional and quick repair methods. By the end of next year we intend to have a complete showroom exhibiting each and every part of all the tools and the different articles that we distribute."

# *Here's a tough piece of goods*

**Cannot be marred or scratched — just thumb nail it; try to scratch or mar it.**

# MAR PROOF LACQUER

Just the material for your postwar product finish. It takes hard knocks. Will stand up under the most severe conditions. Protects as no ordinary lacquer will do! Definitely, your product needs such a finish. This Mar Proof Lacquer produces a splendid transparent finish of full depth on maple, walnut, gum, mahogany and other cabinet woods. Is made in either the Clear Gloss Rubbing or the Satin Finish. Mar Proof Lacquer Sealer is recommended with it for the first coater.

Test Mar Proof Lacquer on your own product—that's all we ask. Working samples free upon request.

**THE SCHAEFER VARNISH COMPANY**
LOUISVILLE, KENTUCKY

# Materials Supplies Equipment

## Vibrator; Packing Tester

The L. A. B. Corp., Summit, N. J., announces a new test table that vibrates and shakes like a freight car, even to the pitch and toss, to test packages and products to be sure they will arrive in good condition and will "work" without home tinkering. One hour's test will equal a coast to coast freight trip.

The table has a mixed motion and a "pitch and toss" in addition to its vertical and horizontal movements. The rhythm is similar to freight cars. The package repeatedly bumps a fence secured to the table, giving it shocks similar to car bumping or train jerks. Smaller packages may be stacked or larger boxes strapped down to duplicate actual freight car loading methods used.

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## New Vinyl White Coating Has High Hiding Power

Increased production and better decorating results are in the making for the metal package industry with the introduction of Rolox Vinyl White Coating Enamel.

Designed to fill the need for a one-coat material with top resistance to food acids and fats, and to provide stability under high and repeated baking temperatures, Rolox Vinyl White may well change the standard of value for sanitary lining coatings for use on foodstuff containers requiring pasteurization, sterilization and processing.

Although Vinyl coatings have been used extensively for several years, they have been low in solids with poor hiding, resulting in costly 2-coat applications.

An outstanding characteristic of Rolox Vinyl White is its extremely high solids—52%, or as much as twice that of conventional types. To this fact alone can be attributed many of the superior properties of this new flexible coating made by Roxalin Flexible Finishes Inc., Elizabeth, N. J.

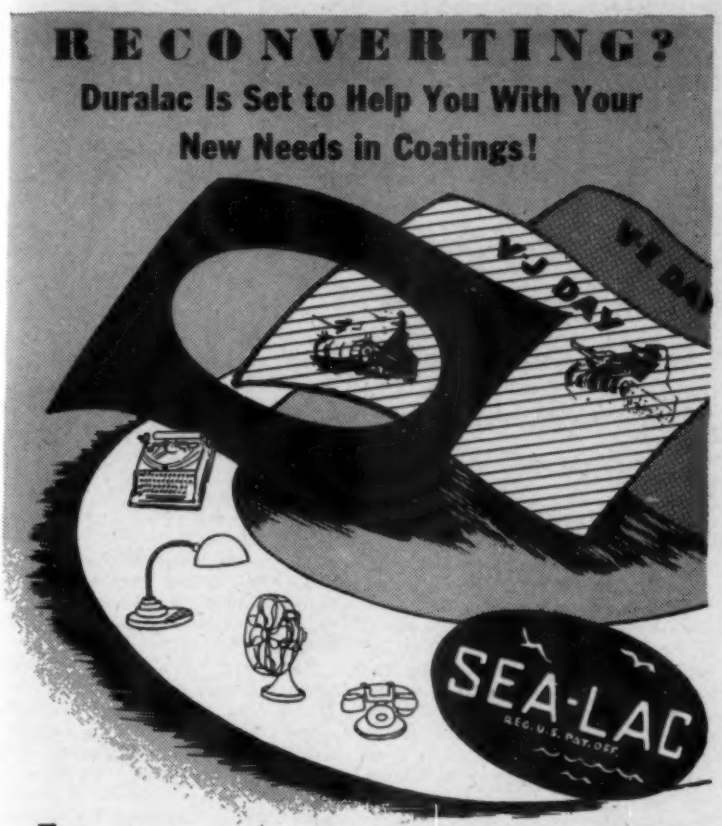
From the increased pigment, hiding power equal to that of two coats of conventional vinyl materials is obtained. The greater vehicle content is responsible for the exceptionally high gloss and tough, mar-resistant film surface, as well as vastly superior flowing qualities that completely eliminate ridging.

Rolox Vinyl White is stabilized in the process of manufacture and will not disintegrate in contact with metals at elevated temperatures. Excellent adhesion is obtained, even when the material is applied directly to unsized black plate, electrolytic or hot dip tin. This, in addition to extreme flexibility characteristic of all Roxalin formulations, makes the coating ideal for the exacting requirements of screw-cap work.

Rolox Vinyl White has excellent original color and color retention and because it will not discolor even under repeated bakings, provides an unusually fine, durable

# RECONVERTING?

## Duralac Is Set to Help You With Your New Needs in Coatings!




AT a moment's notice, we can step in and aid you in working out the specific finish you require. That's because we are a flexible organization, offering a tailor-made service. We proved our versatility to the complete satisfaction of many harrassed manufacturers throughout the tough war years. Today, with the release of long-absent materials, we're geared to do an even better job of trouble-shooting . . . Let us know what your reconversion program calls for in finishes. We'll give you the benefit of our specialized skills and knowledge.

**DURALAC CHEMICAL CORPORATION**

**LISTER AVENUE** **NEWARK 5, N. J.**

base coat for multi-color lithography. The coating is resistant also to sterilization and food processing—no failure will develop after 30 minutes boiling water or 3 to 4 hours of auto-claving at 15-lbs. steam pressure, even in the presence of food fats or other contamination.

Add to these features the fact that Rolox Vinyl White is absolutely odorless and tasteless and the container manufacturer has a new sales tool for use in packaging for the food and cosmetic trade, as well as an efficient and economical one-application roller coating white that will cut production time in the plant.

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## Roller Coating Service

A new method of roller coating, by means of which many metal, wood and plastic products can be finished before stamping, forming or other fabricating, has been developed by the Japan Co., 5103 Lakeside Ave., Cleveland, Ohio.

Combining a specially designed coating machine with carefully engineered infra-red baking equipment, the new method produces roller coated sheets completely baked in three minutes or less, as compared with the 15 to 20-minute period commonly regarded as normal for the process.

The finishing service, not the machinery, is supplied by the Japan Co. However, such considerable reduction in finishing time and cost has been effected by the new process that it has been proved practicable for manufacturers throughout the United States to ship work to Cleveland for roller coating.

Various types of finishes are employed, including paint, enamel, lacquer, varnish and plastic coatings. The process was developed especially for the use of vinyl-base materials, which produce extremely tough coatings. These plastic finishes stand up even under deep drawing of metal parts. All types of coating are applied with great uniformity of thickness, tolerances as close as .001-in. being held to customers' specifications, and uniform color shades, including the most delicate pastels, are maintained without difficulty.

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## "Dipwrap", A Hot Dip Protective Compound

"Dipwrap" is one of the important war-born developments for the shipment and storage of metal, and semi-metal assemblies, parts and tools. It is quickly and easily applied by simply dipping the object to be protected into a container of melted "Dipwrap", either manually or by some simple mechanical device. The coated part is allowed to cool for 5 or 10 seconds, and cased or in some instances shipped or stored "as is".

"Dipwrap" is easily removed when the part is required for use. If the part is small and has been dipped by means of an impregnated, non-wicking string, the string will serve as a rip-cord to start the initial peeling. A larger part may be stripped by slitting the coating with a sharp knife and removing the coating as one would peel a banana.

This resilient temporary coating provides a shock resistant cushion which will reduce surface damage to highly machined parts when subjected to impact. Variations in temperature between 150° F. and 30° below zero will not cause this effective coating to rupture. It is a product of Paisley Products, Inc., 1770 Canalport Ave., Chicago, Ill.

Skilled, experienced American-Marietta industrial finishing chemists have developed the science of formulation to a fine art. And their combined creative skills are backed by a comprehensive knowledge of the intricacies of production-line application.

Marietta Fine Finishes provide quality furniture with an inherent charm. The kind that wins instant acceptance from discriminating buyers.

To add the distinctive loveliness of Marietta Fine Finishes to your products . . . call or write us today.

***A great name in paint making***

**AMERICAN-MARIETTA COMPANY**

Marietta Chicago High Point

## Parts Cleaning Systems

The Gray-Mills Co., 1948 Ridge Ave., Evanston, Ill., announces three new Parts Cleaning Systems for industrial plants.

Model H-71 is a general utility unit—successor to the Gray-Mills Model P-70. The new unit incorporates a centrifugal pump which is used for hose-cleaning parts and for agitating the fluid to accelerate the cleaning of either large parts or small parts cleaned in baskets. A means for air agitation is also provided. A safety device causes the cover to close automatically in case of fire. The overall size of this model is 33-in. long, 34½-in. high, and 21-in. wide.

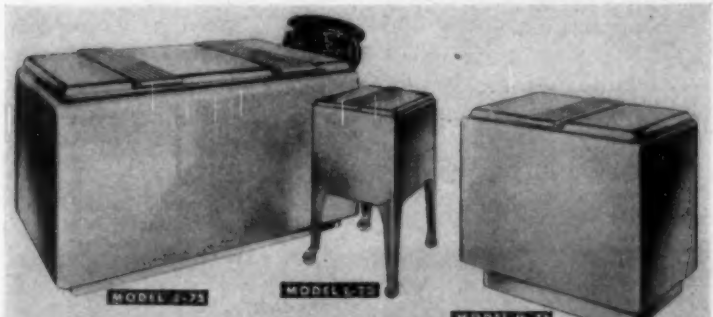
Model J-75 is 60-in. long, 34½-in. wide, and 33½-in. high. It is equipped with a high volume, high-pressure rotary pumping unit for hose-cleaning motor blocks and other large parts. The pumping unit is portable and may be used as a general purpose transfer pump for solvents, oils, etc. This model is also equipped for agitating the fluid by means of air or pump.

The smallest of the three, Model L-73, is 21-in. wide, 21-in. long, and 34½-in. high. Being on castors, it is easily portable. It is frequently used with a special fast-acting type of solvent, such as Speed-Agitene, which Gray-Mills Co. supplies for cleaning carburetors, fuel pumps, etc.

## New Colorful Fabric Resists Mildew

The Pantasote Co., New York, N. Y., announces that a new type of coated awning fabric has been made available to the trade. This product, Texasote G, is an exceptionally durable awning material manufactured in many brilliant colors and vivid designs — a contrasting color each side of the fabric, if desired, to harmonize perfectly with any surroundings or decorator's designs.

This new fabric is a plastic-coated duck. It is flame resistant, mildew resistant, washable and has excellent aging characteristics. In addition to its use as an awning material, these new Textasote G fabrics are ideal for deck chairs, porch furniture upholstery, luggage, seat covers, etc.




All three of the units for cleaning metal parts are similar in exterior design.

***There will be NEW***

- **finishes**
- **patterns**
- **designs**
- **materials**
- **products**

***there will also be the OLD***

**Stille-Young guarantee of customer satisfaction.**

● War is a bitter experience, but some of its lessons learned under pressure are valuable—our business is no exception—new services, new products, developed in war and available for peace-time production mean greater value for the industrial user.

**stille-young**

***manufacturers*** • **lacquers, fillers, stains, enamels, paints**

***Chicago 14***

## Cleans Metal Parts

A new and really effective degreasing material is announced by Kelite Products, Inc., 909 E. 60th St., Los Angeles, Calif. Packaged in an open topped 5-gallon can, with or without parts dipping basket, it simplifies many small shop cleaning problems.

This new material, Kelite Parts Cleaner is extremely effective for the removal of grease, dyes, gums and carbon. Carbon deposits normally difficult to remove, even by such methods as scraping or wire brushing, are so softened by a soak in Kelite Parts Cleaner that they can be wiped off with a cloth.

Dipping parts with metal basket.

Kelite Parts Cleaner is sealed to cut down on evaporation and drag-out. It is safe to use on all metals. It is odorless and has no flash point; it will not burn or explode. It is an extremely versatile and safe shop material. However, as in all materials of this type, operators should wear neoprene gloves.

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## Power-Spray Cleaner

Phillips Chemical Co., 3430 W. Touhy Ave., Chicago 45, Ill., announces a new emulsion-type cleaner, "PSC," for use in power spray washers. "PSC" cleans ferrous and non-ferrous metals and inhibits them against rust, corrosion and hand soil. It is non-toxic and non-injurious to the skin or open cuts; requires no rinsing and will keep the washing tank clean.

This cleaner can be diluted with water in proportions ranging from 1 to 10, to 1 to 100, depending upon the type and amount of soil and the length of time that rust resistance is desired. It is only necessary to wash the parts and blow them dry with air for complete cleaning and rust inhibition. The cleaner removes grease, oil, wax, lapping and drawing compounds of all kinds, red lead and other markings, abrasive dust, chips and filings from the surface as well as from ID and OD recesses.

"PSC" accomplishes its remarkable cleaning action (in preparation for painting) by means of its penetrating properties and its "blanket overflow" action. It penetrates to the surface of the metal, breaking soil into tiny particles which rise to the top of the solution in the tank and are held in the "PSC blanket" while heavy solid

*The Final Touch of Beauty*

## Added by the FINISHER

HERE AT Finishine Laboratories, a great many items have been developed and perfected that simplify the various processes applying to product finishing, repairing, patching and refinishing, helping the finisher today to reproduce and restore all the beauty and sales appeal of the old masters.

Send for our 200-page Catalog which features among hundreds of items, the new "DeLuxe Electro-Knife"—Finishine's Electric Burning-in Knife; the complete assortment of Lacquix Burning-In-Stix; the well-known Lubrisol Pad-O-Paque Process, and the Master Finishers' Supreme Service Finishing and Porcelain Repair Kits. Write today!

*You may attend each month, our Free Courses in Product Finishing and Repairing of Furniture and China, simply by presenting this Announcement.*

**finishine LABORATORIES INCORPORATED**

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particles sink to the bottom of the tank. The "blanket" may be periodically overflowed, keeping the bulk of the solution in the tank clean and avoiding the washing of other parts with soiled cleaner. In addition there is less strain on the pumps and much less possibility of clogged spray nozzles.

## Titrometer Available

Precision Scientific Co., 1750 N. Springfield Ave., Chicago 47, Ill., is now offering a new titrometer, which accurately determines the free and combined acidity of material in either aqueous or non-aqueous highly colored or opaque solutions. This eliminates the uncertain and inadequate color indicators.

The titrometer is applicable for determining the acidity of waxes, greases, common solvents and metal cleaning solutions. The potentiometer method is reliable and reproducible, and the titration media is capable of dispersing or dissolving sufficient quantities of the water insoluble materials under test.

Determines the acidity of a material.

The operation is similar to that of the pH determination. The instrument has two complete titration stands. The alternating current operated electrometer allows the use of any electrode system in acqueous or non-aqueous solutions. The calomel-glass electrode is readable to within 0.02 pH units. The titrometer is equipped with meter scales and potentiometer circuits which give a range of —1.65 to plus 1.65 volts readable to 0.5 millivolts.

## Controls Rate of Heat Rise, and Duration

For batch-type processes and other operations where rate of temperature increase or decrease must be controlled, as well as the actual processing temperature and duration, The Foxboro Co., Foxboro, Mass., has developed the CycleLog Controller, now available as a standard item in the company's line of instruments for measurement and control.

In batch dyeing, for example, the CycleLog Controller will bring the bath temperature up from any starting point, regardless of daily or seasonal variations, to the desired holding point, and do this at any desired rate of rise from 1° to 8° F. per minute. It will then hold the bath at exactly the correct temperature for the correct period of time, and then shut off the heat supply, and signal the operator that the cycle has been completed. By reference to the instrument chart and its notations, any cycle can be exactly duplicated as desired, in any similar plant and regardless of season.

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the quick bake synthetic enamel.
FRANZITE—an air dry or quick low bake synthetic enamel.
RIP-PLS—the superior black wrinkle finishes.
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THE HILO Synthetic Sheet Metal Finishes for roller coat application.
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HILO

## *"Glad to have them back"*

**This is a mild expression of the enthusiasm with which former users of Hilo Protective Coatings are greeting the return of the above products.**

**A trial lot of ten gallons of any of these Hilo favorites will be sent on approval.**

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# Infra-Red Drying of 2-Color Steel Drums

By ELTON STERRETT

ORIGINALLY installed to bake the finish on reclaimed steel shipping drums being processed for U. S. Army use, our infra-red tunnel of heat lamps was counted on to speed up drying when the painting of drums was switched to civilian needs. Basically, there was nothing different between Government specifications and those covering drum-reclaiming for refineries and other industries using the standard 55-gallon drum for shipping products. But the Army drums were one-color jobs, and wartime inspectors were more interested in getting speed than uniformity of finish—whereas the industrial user likes to individualize his package, even when it is just a steel drum. So, two and 3-color jobs became the rule, sometimes with special stenciled designs being added.

The initial set-up carried the drums between banks of heat lamps arranged much like overgrown and articulated parentheses ( ), with each drum being given 1¼ turns while passing through the tunnel. Lamps with built-in reflectors were used. A narrow gap was left at the top of the tunnel to permit passage of the hooks suspended from the overhead conveyor. To prevent lamp breakage due to paint drippings, the base sections were set just wider than the circle described by the bottom chime of a drum.

To meet peacetime requirements, the drums, instead of entering the spray room cold, were preheated by passage through a short tunnel of heat lamps. Their entering temperature checked at 120° F. The drums required no handling after the special bung was screwed into the 2-in. opening.

In our multi-color finishing, the original spray booth was used for applying what might be termed the all-over body coat. Additional colors were sprayed after this first color had been baked; this prevented any runs or streaks. On many of the drums the middle space between "hoops" is specified to be painted with a contrasting color. Drum heads may also be given a different color.

The extra color areas are sprayed while the drums are in horizontal position, either at rest or rolling slowly over parallel rails which are level or slightly inclined. The rails, of course, are spaced so that only the previously painted (first coat) areas of the drums contact them, therefore no wet paint from the added color touches them. The added color coat is also dried by infra-red heat lamps—as the drums roll along over the track.

Peacetime production emphasized the value of time-study, which was neglected or ignored on the Army jobs because there wasn't anyone available to do the clocking. Soon it became apparent that the infra-red bank (following the first spray coat) was a bottleneck. A good operator could spray the entire surface of a drum in 50 seconds, or he could localize the ground coat to the ends in 60 seconds; but to push the painted drums through the infra-red tunnel at that rate did not give us a satisfactory drying job.

Since it is difficult to take the temperature within an infra-red tunnel, due to the type of heat set up there, experiments were made with a photometer. It was found that the relation between heat and

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WRINQUIK is being used IN PRODUCTION — on typewriters, adding machines, home safes, electrical appliances, and many other metal and plastic items. Also on wood!

Proven, fast curing WRINQUIK bakes hard and uniform under any of the following conditions:

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| Sheet Metal | Infra-Red | 10-12 minutes | | |
| Sheet Metal | Oven | 30-45 minutes | at | 300°F. |
| Sheet Metal | Oven | 60 minutes | at | 225°-250°F. |
| Plastics | Oven | 60 minutes | at | 225°-250°F. |
| Wood | Drying Room | Overnight | at | 110°F. |

WRINQUIK black comes in three textures — fine, medium, coarse. Colors listed below — or your own standard shade in production quantities.

Perhaps WRINQUIK can help you solve some production headaches. It cures them — by curing fast! Why not get acquainted? Without obligation, use coupon for the fastest service you have ever seen!

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[ ] Please send free sample of "WRINQUIK" in color checked.
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NAME _____ TITLE _____

COMPANY _____ ADDRESS _____

light from each lamp was close enough so that if a light showed up poorly on the light meter, it was probably also not a good heating unit. The advantage of the light meter lay in the fact that it could be used at a distance of 3-ft. or more from a unit, while the pyrometer had to be located within the effective working distance of the unit.

The photometer quickly showed that the lower units of infra-red lamps—those set to dry the bottom of each drum as it hung from the conveyor chain — were not baking the finish as rapidly as did those higher up. The lag was at the lower horn of each parenthesis, so to speak. A careful check-up of these units developed the fact that they were quickly coated with a thin but nonetheless effective insulator, composed of dust, lint and tiny specks of enamel from the spray-booth ventilating system. This undesirable coating, not visible to the naked eye while the lamps were aglow, was enough to retard the effective heating of the surface on the under sides of the drums.

More frequent cleaning of those heat lamps that faced upward helped to remedy this trouble. The glass lenses were cleaned with a rag moistened with solvent to remove the specks of paint which had strayed there and become baked on. This was followed by polishing with a clean dry cloth.

Formerly it was the practice to leave each heat lamp bulb in one socket during its useful life. Now all bulbs in the lower banks are moved to top or side panels after delivering approximately one-third of their expected service life. This keeps the newest (and hottest) bulbs in the bottom third of the bank, thereby adding another factor to the development of maximum heat where it is most needed for baking the paint coating uniformly.

With the plant working three 8-hour shifts a day, six days a week, all changing and shifting of heat lamp bulbs are now made on Sunday. During this time the lower banks of heating lamps are thoroughly cleaned. This practice reduces lamp breakage, as no one has occasion to enter the tunnel during working hours. Even if some lamps fail along the side or top area of the tunnel, the loss of heat is not sufficient to slow up the baking process, as would be the case if the failures occurred in units lower down.

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## Spray Painting Courses for Industrial Finishers in '46

Four one-week courses in the first half of the 1946 School of Spray Painting, conducted by The DeVilbiss Company, Toledo, Ohio, will be devoted to industrial finishers. Free to users of DeVilbiss spray-painting equipment, these courses will be identical in classroom instruction and shop work. Scheduled starting dates are January 14th, March 11th, April 8th and June 10th.

DeVilbiss urges industrial finishers interested to write for reservations at least two weeks in advance of any session.

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## Penetone Enlarges Plant

The Penetone Co., Tenafly, N. J., manufacturers of non-inflammable, non-toxic degreasers for over ten years, announces that its peace-time program is now under way. This includes the addition of a second story to the plant at Tenafly, and the purchase of a site adjoining the present one, and including a railroad siding.

The Industrial Division will continue to sell the line of degreasers and cleaners, headed by the liquid concentrate, Penetone. The Automotive Division and the Consumer Division have been formed for the distribution of a small package line.

In addition to the expansion of its present building, construction has already been begun on the new property, of a second building to be an exact duplicate of the existing one. This will afford additional facilities for production and storage.

*Dependability plus-*

# YARNALL
## INDUSTRIAL FINISHES

have that PLUS factor because —in the making it's a "must" with Yarnall that provision be made for accomplishing *more* than minimum requirements. They never fail *because*, they have—"*Something to spare.*"

# Booklets Catalogs Circulars

## Booklet on Cellulose Acetate

A revised edition of the technical reference booklet on Cellulose Acetate has just been issud by Hercules Powder Co., Wilmington 99, Dela. It contains 36 pages 8½x11-in. and is bound between heavy paper covers. Contents include charts, tabular matter and information about cellulose acetate lacquers, dope solutions, etc.

## Booklet on Better Lighting

Closely connected with the subject of good lighting is the matter of how to obtain it. Two types of lighting are necessary to secure desired results—Balanced Lighting—and it is achieved through the use of localized and general lighting units.

A new 8-page booklet entitled, "Better Lighting on the Job," presents a quick, but thoroughly understandable explanation of the subject. A free copy can be obtained by writing to The Fostoria Pressed Steel Corp., Fostoria, Ohio.

## Free Book on Modern Coatings

"Modern Coatings Based on Bakelite Resins," is the title of a new 20-page colorfully illustrated booklet written for manufacturer, engineer and product designer, to present a new conception of the importance of planning the coating as part of the structure. This booklet contains information, clearly presented, which should be at the finger tips of every industrial user of paints, varnishes, lacquers or enamels. For a free copy, write Bakelite Corp., 30 E. 42nd St., New York 17, N. Y.

## Aluminum Paint Guide

A small colorful folder entitled, "A Guide to Using Aluminum Paint," presents some interesting and timely information about using aluminum paint "where it's hot, where it's moist, where it's fumy," on various kinds of surfaces inside and outside. Copies can be obtained by writing Crescent Bronze Powder Co., 120 W. Illinois St., Chicago 10, Ill.

## Instructions on Taking Care of Water-Wash Spray Booths

Detailed process specifications (5 typewritten pages in a binder) for compounding, masking and cleaning water-wash spray booths have been carefully compiled by, and are now available from The DuBois Co., Cincinnati 3, Ohio. This information is important and valuable to anyone who has anything to do with water-wash spray booths.

## Peelable "Liquid Envelope" Coating Announced

Better Finishes and Coatings Inc., 168 Doremus Ave., Newark 5, N. J., has issued a 16-page illustrated book describing the use, properties and technical data on its peelable plastic film, "Liquid Envelope."

This material is believed to have many peacetime applications, such as protecting laid-up tools or equipment; as a peelable protective-coating for finely-finished metal, wood or plastic surfaces during manufacturing operations.

Copies of the "Liquid Envelope" booklet are available without cost or obligation.

## How to Find Out Quantity of Drier in Paint

"The Qualitative and Quantitative Determination of Drying Metals in Driers and Surface Coatings" is the title of a new booklet issued by the Laboratories of the Nuodex Products Co., Inc., Elizabeth F, N. J.

The booklet is the first complete reference work on drier analysis, and gives the paint chemist a convenient, single source of reference for drying metal determination for use in his laboratory control work, in analyzing complaints, and in studying competitive material. It describes in detail three methods of drier determination, two qualitative and one quantitative. The methods cover analyses for drying metals in paints and varnishes before application, in dried paint and varnish films, or in powdered, liquid or plastic driers.

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## THAT ADDS "Sales-appeal" to METAL PRODUCTS

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2,353,058

SUNBRITE Metallic Paste Pigments produce a smoother and brighter finish that adds new beauty and sales-appeal to all kinds of metal products.

Available for immediate shipment . . . all metallic shades . . . covers more square feet per gallon and AT NO EXTRA COST.

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### ON ESSENTIAL SMALL PARTS

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A combination dipping-whirling machine for coating large quantities of small parts. All operations are within the machine. Parts are dipped into coating material, raised and whirled. No additional tanks required. No cleaning when changing colors. Cuts costs and saves up to 90% of material.

***Washer and Dryer operates on same principles.***

Write for further information or submit samples to be coated.

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Industrial FINISHING

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# Editorial

## Looking Back and Looking Ahead

The close of 1945 brings to an end a year of history-making events. Most important to all of us was the end of two big wars for the U.S.A.—the war in Europe and the war in the Pacific. Wars cause much confusion, expense, inconvenience, and a general upsetting of peacetime activities—and unfortunately many of those unsettled conditions continue to plague us long after war is officially declared at an end.

Reconversion to civilian production and peacetime activities, as we are learning by experience, is not rapid nor orderly nor pleasant. It is not nearly up to expectations—but it is taking place. For most of the manufacturers of civilian goods, war production is out and civilian production is either getting under way or being planned for the future. Some materials, supplies and other necessities for full production of certain planned products and activities are still not available, but they will be eventually. So, we have much to be thankful for and much to look forward to in 1946.

Improved materials for cleaning surfaces and protectively coating them will be offered. Also, we will have an opportunity to choose from a greater variety of better equipment for cleaning and rustproofing iron and steel surfaces; and for applying coatings of paint, varnish, enamel and lacquer; and for quickly drying, baking or curing those coatings. More and better facilities will be available for such work as cleaning, graining, stenciling, taping, rubbing, use of decals, etc.

Many manufacturers who haven't already done so, plan to have their product painting or finishing departments rearranged and laid out for more economical streamlined operation. Conveyors will be utilized more than formerly; the sames applies to automatic and semi-automatic spraying; dipping and flow coating equipment; roller coaters, and tumbling and whirl

*(Continued on page 130)*

ILLBRONZE
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## BRONZE POWDERS NOW AVAILABLE

We can now supply users of metallic finishes with our many special shades in various textures. Our many friends who have used our pre-war line of special alloys and colored metallic finishes can look again to ILLBRONZE with confidence for their future needs. Right now we can furnish limited quantities of fine Pale and Rich Gold Lining Powders, Silver Fixture and Butler Silver. Unrestricted quantities of ILLBRONZE Brand Aluminum Powders and Pastes can also be obtained.

Inquire for lowest prices. Also samples, if desired.

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## *use* NAZ-DAR *Silk Screen Plates*

★ The MODERN method of applying decorative designs, lettering and trade marks. Provides absolute UNIFORMITY, SPEED and LOW-COST. You can apply on any surface.

NAZ-DAR Silk Screen Plates have played an important part in war work, being used to produce lettering or sharp detail on many types of surfaces, such as radio dials, airplane dials, instrument panels, chassis, boxes, clothing, etc.

We maintain a complete service for the trade and can supply you with any type of Silk Screen Plate needed, as well as Silk Screen Inks and Lacquers. All production men should investigate the application of Silk Screen Stencils to their production problem.

★ Write Department IF-12 for information on current and post-war printing problems.

*Naz-dar Company*

469-483 MILWAUKEE AVE., CHICAGO 10, ILL.

coating machines. Electrostatic equipment has proved its usefulness for making a fixed spray gun spray paint all around small objects without rotating same; and for removing tear drops of paint which persistently cling to the low corners of dip-coated parts and products. Better lighting, more efficient ventilation, and facilities for real cleanliness are now considered essential in product painting and finishing departments.

Everything that contributes to more decorative painting and finishing of products is now in demand; for example, facilities for graining, screen stenciling, novelty pattern finishing, and striping. Smooth attractive colorful surfaces will be a welcome change from the lusterless O.D. coatings used on so many products during the war. Many of the new and improved finishing materials for 1946 will be presented editorially in the January "Looking Ahead" issue of this magazine. In the meantime, INDUSTRIAL FINISHING wishes all of its friends and readers a Happy Holiday Season and a Safe Prosperous New Year.

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## Start Research, and Plan for Future

★ It is not necessary for you to have a college degree to do research work. All that is necessary is the will to find out for yourself the various potential improvements that can be made in your products —to present your production staff and sales staff with a better item to sell. How to start a research project is very simple.

First look throughout your organization for one or more poets, as a very successful businessman calls them. They are the dreamers and schemers in your outfit. Give them a comfortable office or workroom. Provide them with good light and plenty of magazines that fit into your line of merchandise. Get them a supply of the latest finishing books and catalogs. Set up a budget as to how much money you are ready to lay out for all the necessary conveniences.

Give your potential research men complete freedom of the plant. Let them talk to whoever they wish; let them garner information from all corners of your plant and from out of the plant. Let them consult with representatives of other crafts that have a bearing on your particular one; and above all, if they want to put their feet on the desk let them do it. The results will be astounding and unbelievable. Given the various conveniences and freedom, your research staff will pay for its keep over and over again.

These methods certainly seem ridiculous. But I have seen them work in $200,000,000 industries—and a two hundred million dollar industry knows that through research, business pays off in the black.

How to start a project through research? Send a memorandum to the department. See that all of them get a copy of it. In the memorandum state what is desired. For example: "Our competitors have come out with so and so, which does not compare with our product, but they seem to be doing a big job of beating us to the punch. Devise ways and means of improving our product to a higher degree, or recommend the proper

★ Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

## Mac's Famous Fashion Sealers and Lacquers

There is no better combination for a wood-finishing production operation on fine furniture and case goods than MAC'S FAMOUS FASHION SEALERS AND LACQUERS.

Many leading furniture manufacturers throughout the country have standardized on Mac's Fashion SEALERS AND LACQUERS which have been especially developed for this trade over a period of many years. Samples will gladly be furnished to any manufacturer who is interested in fine finishes and low production costs.

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**Headquarters for Fine Finishes Since 1875**

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## I. C. D. FORMULA NINE
## NON-INFLAMMABLE
## « wax free REMOVER »

**for paint, varnish, lacquer, baked enamel, adhesives**

**EASY TO APPLY—NO AFTER-CLEANING**

**ORDER TRIAL GALLON AT DRUM PRICE**

**I. C. D. FORMULA 9** is the standard of safety and quality . . can be sprayed or brushed . . doesn't raise grain nor discolor . . quickly removes all kinds of finishes and coatings . . costs less to use . . saves time, labor and material.

**SPECIALTY COATINGS**—I. C. D. Labs. have specialized in the formulation and manufacture of non-inflammable coatings and substitute finishes. If you have a tough coating or finishing problem send in your specifications, finishing schedule and requirements. Immediate action and a prompt reply promised.

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action to offset our potential loss of business. Results will come without too great a loss of time because the poets and dreamers will come through.—A. NORMAN.

## Time Marches

★ There is a very popular song called, "When the Lights Go On Again, All Over the World." That should be the theme of 1946. Each and every one of us, from the Chairman of the Board through the entire organization make-up of our vast industrial system, should strive toward a better understanding between men in an honest human way.

What good is modern efficient machinery and plants whose purpose is to create more and more of better things for better living when there isn't the wherewithal to buy those better things. On the other hand, what good is the seemingly everlasting viscious circle of strike, strike, strike, for more money when costs have to be increased to pay the "more money."

Civilization is looking forward anxiously for signs of more friendly business and family relationships. Less of hate and greed should be the program; more of help. Help others make headway. Give square honest advice. Let us start by eliminating the necessity for having a "pull," and in its place let's give our neighbors a boost.

Let us eliminate chiseling and cut-throat competition, and put real merit and quality of work to the front once again. Let us give full value for value received. Yes friend, it's you and I together who can help put the lights on again in a battered bewildered world.—N. B.

## Your Products to be Seen by Television

★ Science, using one of man's oldest senses, is getting ready to place amplified attention on your product. Can it stand the spotlight?

Yes, practical commercialized television is coming. In the not too far distant future large department stores will use it in technicolor to present everything from compacts to sauce pans and from venetian blinds to toy automobiles on a central screen, or in a show window, combined with amplified sound, so that thousands may see and hear. Much tiresome walking, pushing through crowds, and standing will be eliminated. Womens clothes, hats, furniture and kitchen ware will be shown in true colors and explained through loud speakers, televised right in the department store studio, while milady sees, learns and inwardly digests, comfortably seated in an air-conditioned auditorium.

Your product will have its turn under the bright lights. What about the design, and more especially what about the finish? There is no better time than the present for product study and plans to take advantage of new methods, materials and equipment to attune your product to the searching eye of television.—P. C. B.

## Send Only Clean Work To Wood Finishers

★ Many times we read about the urgency of sending the unfinished furniture into the finishing room clean and free from glue marks. Too bad some of the heads of finishing departments don't show those articles to the men in charge of cabinet making or wood assem-

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## PAINT SPRAY FUMES

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# *Ballou's Metal Finishes*

Will improve the appearance of your products and duplicate closely real plated finishes—

- **Super Bright Gold Bronze Powders**
- **Super Bright Copper Bronze Powders**
- **Chrome Aluminum Paint**
- **Chrome Aluminum Paste**
- **Aluminum Powders and Pastes**

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**EDWARD C. BALLOU CO.**
**6 VARICK STREET NEW YORK 13, N. Y.**

bling, and ask for cleaner merchandise.

Suppose we look only at the cost angle. There is the difference in labor of hauling the unfinished merchandise to an inspector's or preparer's bench in the finishing department, the inspection usually hurriedly done, the reloading of the merchandise and returning it to the first finishing application; this as against an inspection on the spot by the cabinetmaker or wood assembler, and the direct haul of merchandise to the first finishing operation.

In any industrial finishing organization working on wood products, the money saved in the direct approach will be considerable, besides the extra time saved which means increased output.

True, it requires tact and diplomacy on the part of the finishing room head to present his case to the cabinet department, but in the final analysis all departments are working toward one common goal and there should be real cooperation between these departments. The American furniture industry has grown up, and inter-department cooperation is a fundamental necessity in the production picture. —NORMAN ABRAMOVICE.

## Opportunities to Utilize Scrap Profitably

★ If you have imagination, take a walk out to your scrap heap and see what is being discarded or sold for junk. You may be surprised at the quantity of sheet metal, plywood or pressed fiberboard that could be used profitably for making small parts or products.

Several years ago while manufacturing kitchen cabinets and medicine cabinets, I noticed in my scrap heap strips of steel that were too narrow for shelves. This material was being sold as scrap. A little thought soon turned these strips into vegetable bins and gave me a new department-store outlet. Vegetable bins lead to clothes hampers and draft-proof window ventilators. As a result, my scrap dropped to next to nothing and my profit increased. Of course, all of these products were given a durable and attractive coating of paint.

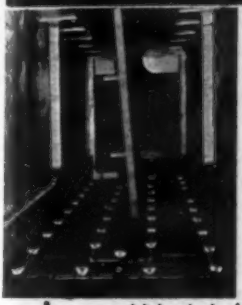
I mentioned my experiences on two different occasions and, as a result, two people put the idea to work, and now each one has a profitable business using materials that other manufacturers throw away. One individual is buying scrap material and making 10,000 to 15,000 dustpans a day. The other takes the scrap from a woodworking shop and makes novelties such as wall brackets, match holders and playthings for youngsters. I believe he manufactures 50 items all made from scrap.

Of course, these products made from scrap must have utility and decorative value. They must be reasonably well designed and manufactured — and, above all, they must have a paint job or finish that produces real sales appeal. As a matter of fact, the paint job is perhaps the most outstanding feature. All of these factors enter into what it takes to produce large volume sales.—W. BEACHAM.

## Haeuser Shellac Co. Appoints W. J. McIntosh as V. P.

The Haeuser Shellac Co., Inc., Brooklyn, N. Y., announces the appointment of William J. McIntosh as Vice President in charge of laboratory and plant management. For the past 13 years Mr. McIntosh was chief chemist for a manufacturer of finishing materials in Rahway, N. J.

# Drying Time Reduced... 76 2/3%



with

**BURDETT** *(The Original)*
**INFRA-RED GAS BURNERS**

*Indirect-fired 30 minutes @ 200° F.*
*Burdett Infra-Red time 7 minutes @ 200° F.*

That is from the records of the Canadian Top & Body Corp., which is further proof of the remarkable results that pyramid into revolutionary savings in labor, material and fuel, and the elimination of rejects. This user further testifies that the heat contained in the parts from processing the prime coat was sufficient to force dry the finishing coat—a complete operation eliminated! Get the facts on Burdett "Infra-Red" Gas Burners in connection with your heat processing.

21 NORTH LOOMIS STREET, CHICAGO 7, ILL.

**BURDETT** MANUFACTURING CO.
*Infra Red Gas Burners*

# CEL-U-LAK No. 5354

*Fast drying, clear protective film for metal surfaces*

**5354 CEL-U-LAK** gives a thin, colorless, tough adherent film of great resistance to rust and tarnish . . . Widely used for tools, hardware, sporting goods, lighting fixtures, etc. . . . Can be reduced 100% to 200% and applied by dip or spray.

**The Varnish Products Co.**

5204 HARVARD AVE. CLEVELAND, OHIO

**NALCO**

**Infra-Red Ray Lamps**

Best for Infra-Red Ray Baking and Drying

Carbon Filament Lamps, service proven, available in Inside-Silvered (self-reflecting) or in Clear Glass types. Write for details

**North American Elec. Lamp Co.**
1030 Tyler St. St. Louis 6, Missouri

**DAVIDSON ENGINEERING SERVICE**
*Consultant Engineers*
Conveyor Systems Labor Saving Devices
Plant Layout
Designers of Special Equipment
*Address:* Box 2941
Winston-Salem, N. C.

***Detroit***
**HANDY 'TAC' RAG**

★

An outstanding quality Product for 9 years, your INSURANCE POLICY for a perfect Mirror-like finish. Protect the dollars spent on Paint and Labor, for just a few cents, by using DETROIT HANDY 'TAC' RAGS to guarantee a perfectly clean, dirt and dust free surface. DETROIT HANDY 'TAC' RAGS remain soft and tacky indefinitely, never dry hard or stiff. Always ready for instant use. Spontaneous Combustion Proof.

*DETROIT HANDY 'TAC' RAGS now available for immediate delivery. At your leading Paint Dealer, or write to Manufacturer.*

★

**DETRO SALES CO.**
414-416 NORTH SAN PEDRO STREET
LOS ANGELES 12, CALIF.

## Auto to Be Cooler

AUTOMOBILE manufacturers in Detroit already are planning to give the public a car that will be cooler on the inside during hot summer months. They will accomplish this by a coating of special heat-reflecting paint.

The paint, due to the efforts of Army-Navy research specialists who wanted to make planes, trucks and tanks more comfortable in the tropics, is composed of many commonly used pigments, which together have heat-reflecting properties.—F. C.

## Removing Soldering Flux from Stainless Steel

RAPIDLY increased utilization of stainless steel in manufacturing the weapons of war and products of peace has brought scores of plants face to face with many new or unusual fabricating problems and production kinks. In this category is the job of removing acid flux from pickled finish sheets after soldering, to prevent either attack or staining of metal.

More and more plants are discovering that this work can be handled easily and effectively with either an alkaline or acid-cleaning technique developed by one of the nation's foremost manufacturers of degreasing compounds. Procedure used depends upon condition of the work.

The method most generally followed consists of thoroughly cleaning the entire part immediately after soldering operations, while the flux is still in liquid form and before it has time to dry down and harden. It is immersed in a solution made up with the recommended alkaline cleaning agent at

room temperature; it is allowed to "soak" for a few minutes and is then brushed and rinsed.

Splattering and fumes from the flux may coat the metal with acid at points away from the joint itself and, if not removed, this will result in pitting and corrosion of surfaces; therefore this neutralizing treatment is recommended for the entire part, rather than the solder joint only. Where the flux has become oxidized and hardened, the work is immersed in a special acidic solution.—A. P. SCHULZE.

## Product Development Laboratory

A new laboratory for research and product development, has been opened by Egmont Arens, Industrial Designer, 480 Lexington Ave., New York, N. Y.

## Experiments Being Conducted On Anti-Corrosive Solution

S. S. Pierce, research metallurgical engineer for Rheem Research Products, Inc., Baltimore, Md., is conducting tests for several manufacturers on metal finishing products to determine the suitability of Iridite, anti-corrosive treatment for surfaces exposed to weather, on particular items. The experiments are being carried on at Wagner Brothers, Detroit, Mich., where a testing laboratory was recently installed.

Extended tests on paints indicate that Iridite prevents zinc from "poisoning" paint. It prevents formation of a soapy, chalky underlayer that destroys adhesion. Mr. Pierce explains that metal treated with Iridite (a chemical solution) multiplies the life of zinc and cadmium coated articles even under severe usage.

Iridite was widely used during the war. It has been demonstrated, in some cases, that one coat of baked enamel applied over Iridite is equal to several coats of the same enamel applied over zinc without Iridite in salt spray tests. Adhesion is greatly improved and flexibility is possible in the more abrasion-resistant and more hard finishing materials.

UP GOES EFFICIENCY
*thanks to Jensen Engineering*
DOWN GO COSTS

AT Contract Specialties Corp., Detroit, Jensen-built *light weight* conveyors and special-paint dip tanks speed production, save labor on refrigeration dehydraters. Photo shows how unusual arrangement of trolleys on 13" centers with hanging rings every 3¼" (optional) saves conveyor space. Now look at dip tank. See how offsets, to accomodate agitators, banish danger of damaging agitator propeller blades should pieces fall from conveyor.

*Your problem, too, can be solved by Jensen. Phone, write or wire today!*

JENSEN SPECIALTIES, Inc. JENSEN 9331 FREELAND DETROIT 27, MICH.
DESIGNERS and BUILDERS of "DUAL HEAT" INFRA-RED OVENS • STANDARD and SPECIAL CONVEYORS

**Power Graining Machine**

1. Cycle time 25 seconds.
2. Will cover a surface up to 31" x 80".
3. Automatic roll cleaner.
4. Cuts production costs.

AMERICAN RICHWOOD PRODUCTS CO.
(FORMERLY AMERICAN ELECTROTYPE CO.)
*Graining Plate Division*
184 E. MASON ST. MILWAUKEE, WIS.

**MIRACLE**

5 Gallon BLUE BOY Model

**PAINT REJUVENATOR**

Restores Paints, Lacquers, Enamel Products and Pigment Primers, to original consistency in 3 to 10 minutes without opening the can. Available for Round or Square 5-gallon cans. Explosion proof electrical equipment if desired. Also other units from ¼-pint to 50-gallon drum capacity available. Originators of Paint Rejuvenating Equipment—ten years—thousands of satisfied users.

**Miracle Paint Rejuvenator Co.**
127 E. 9TH STREET ST. PAUL, MINN.

## Why That O. D. Paint Didn't Dry Fast

WHEN there is trouble in the the finishing room it is sometimes because the supervisor does not adhere to fundamental principles in finishing, but makes another error which results in two errors instead of one. I ran across such a case just a few weeks ago. The customer was spraying olive drab enamel on steel parts for ordnance work.

In their operation it is necessary to spray the parts, and within two minutes have these parts sufficiently dry so that they may be handled without picking up the paint; and in a period of eight minutes the paint film must be sufficiently dry so that masking tape will not pick up paint from the article. I had tried to straighten out their difficulty, which was lack of drying, over the telephone but was unable to do. Consequently, on the following Monday, I called on the account and took along some aromatic solvent in place of the VM&P naphtha they had been using. By mixing the aromatic solvent into the paint we found that all batches, which had previously been rejected, worked satisfactorily.

This enamel is fairly thin, requiring a reduction of only about 8-to-1 for spraying consistency. When the paint film did not dry they had added more reducer to the paint. The reducer they were using was VM&P naphtha. The enamel was so formulated that it would stand a reduction of eight parts enamel to one part thinner with naphtha, but when an equal quantity of naphtha was added to an equal amount of enamel it seemed to throw the paint not completely out of solution but enough so the film would not dry.

Fine...Fine
Superfine!
Claremont Flock
Finely cut fabric particles, many colors, many types . . . fluffy, yet filling. Excellent for sound-proofing, insulation and surface protection. Also, applied decoratively to assimilate suede leather finishes, velvet, velour and mohair upholstery effects. Full details, samples and prices upon inquiry.
COTTON
WOOL
RAYON
CLAREMONT WASTE MANUFACTURING CO.
The Country's Largest Manufacturers of Flock
CLAREMONT, NEW HAMPSHIRE

Up to a certain point, further reduction will cause a paint film to dry better *but beyond that range you increase the amount of wet film necessary to get coverage.*

In order for paint to dry the solvent must be released from the film. Accordingly we went back to the old procedure of thinning the paint to from 18 seconds to 26 seconds viscosity with a No. 4 Ford Cup at 78° F., and holding the reduction of the material within that range in order that we could spray on a film that would dry. Their troubles are now over.

I have seen this same situation of increasing reduction in a number of cases. I believe that when trouble occurs in drying, instead of further reducing the paint, we should go back to the old principle that if the paint is thinned properly it should have a sufficient coat on there to cover, and then proceed from that basis to correct further trouble.—G. W. OUTCALT.

**NEW ENGLAND SALESMAN WANTED**

By progressive, medium sized, independent, middle-western manufacturer of all types of wood and metal finishing products. Considerable business already established. Prefer man now selling furniture and other industrial trade in New England. Very liberal compensation based upon results. Write full particulars of age, experience, volume of sales, class of trade, and enclose small photograph. Address IF-270, care Industrial Finishing.

SAN-ITAI-RIE
CRACK AND CREVICE FILLER
OLD FRIENDS ARE BEST!
Three generations of wood finishers have used SAN-ITAI-RIE FILLER. It still is best for all defects in wood.
SAN-ITAI-RIE FILLER CO.
DIVISION OF G. J. Liebich Co. CHICAGO 22 ILLINOIS

**PAINT OVERSPRAY**
From water curtained spray booths
Will purchase or reclaim
**MECKLER CHEMICAL CORPORATION**
3748 E. 91st St.
Cleveland, Ohio

MISKELLA
INFRA-RED OVENS & APPLIANCES
INSULATED · REFLECTIVE · SECTIONAL
BY
INFRA-RED ENGINEERS & DESIGNERS
CLEVELAND, OHIO

## More Mechanized Production

From the drawing boards of machine designers currently burning the midnight oil to blueprint improved machines for tomorrow, will come equipment that should enable manufacturers to slash their production costs. This, in turn, will allow them to price their products on a basis that will insure a high volume of sales and employment after the war.

Jobs, the most important thing after the war, depend largely upon prices. The more a manufacturer is able to reduce the price of a desirable product, the more people he will get to buy that product, and therefore the more people he can employ. How does he get his prices down? By reducing his costs. And how does he get his costs down? By the intelligent use of more efficient machinery — automatic and semi-automatic.

## *Chadeloid Appoints Mayers Research Chief*

The assignment of John W. Mayers, formerly with Monsanto Chemical Co., to direct the research and development program to be undertaken for the Chadeloid Corp., effective November 1, has been announced by Dr. E. L. Luaces, president of The Commonwealth Engineering Co., Dayton, Ohio.

Graduate of Princeton University, 1939, with a degree of B. S. in chemical engineering, Mayers will direct the laboratory program of Chadeloid as a service to licensees under the Chadeloid non-bleeding, non-grain-raising, color-true wood stains patents.

The application research and development program of Chadeloid, according to Dr. Luaces, will be directed toward two objectives: providing technical data on applications for the woodworking industry, and broadening the base of the Chadeloid patent formulations and processes in order better to serve the stain manufacturers as well as the general public interest in improved wood-finishing materials.

## *Classified Advertising*

**Rate: 50 cents per line per insertion—minimum $1.50**

### POSITION WANTED.

Salesman desires position with industrial or trade sales paint company. Can furnish excellent references. Wisconsin territory desired as that is the area where my connections exist. Address IF-263, care Industrial Finishing.

### STAIN & FILLER MAN.

Well versed in the formulation and production of stains, fillers, etc. Background of 30 years' wood finishing products. Address IF-262, care Industrial Finishing.

### POSITION WANTED

As finishing foreman with a reputable casket company. Have 25 years' experience; two years as finishing foreman. Can furnish A-1 reference. Or service man for a reputable paint company. Address IF-259, care Industrial Finishing.

### INDUSTRIAL SALESMAN

Desires position selling for company handling a complete line of finishes for metal and wood. Practical man with 18 years' experience in selling in Indiana and Missouri. Address IF-265, care Industrial Finishing.

### FINISHING ROOM FOREMAN

Wanted by furniture manufacturer of Bedroom and Sun Room furniture; excellent opportunity. Give full details. Address IF-258, care Industrial Finishing.

### SALES ENGINEER WANTED

For the metal industry. Experienced in synthetic, organic finishes. Will have complete charge. Address IF-257, care Industrial Finishing.

### LACQUER CHEMIST WANTED

To take charge of a growing lacquer factory in New York area. Good salary for the right man. Address IF-260, care Industrial Finishing.

### LACQUER SALESMAN WANTED.

Well-known Eastern lacquer manufacturer wants a man with sales experience or with a good background of practical finishing knowledge to sell lacquers in the New York Metropolitan area. This is a big opportunity for the right man. When writing, outline past experience. Address IF-261, care Industrial Finishing.

### WANTED.

PAINT AND LACQUER SUPERVISOR—with practical experience in paints and lacquers for materials and process development work. Address IF-266, care Industrial Finishing.

### EXPERIENCED FORMULATOR

On industrial finishes wanted by Chicago firm manufacturing industrial finishes only. Permanent position. Address IF-266, care Industrial Finishing.

### WANTED—TWO SALESMEN

To call on hardwood finishing trade in New York area and vicinity by leading manufacturer located in New York. Prefer men with sales experience or who have practical finishing background. Ample drawing account and commissions for the right men. In your reply, state past experience. All replies will be held in strict confidence. Address IF-264, care Inudstrial Finishing.

### INDUSTRIAL SALESMAN

Wanted for the New England and greater New York territories by old-established paint manufacturing company. Must have chemical engineering or electrical engineering training. Give age and experience. Salary and bonus plan. Address IF-267, care Industrial Finishing.

### CHEMIST OR CHEMICAL ENGINEER

Age 25 to 30; some experience or educational background in lacquer formulation and testing. Good working conditions, excellent opportunity. Write personnel department, BRUNSWICK-BALKE-COLLENDER CO., Muskegon, Mich.

### PAPER TRANSPARENTIZER

Technical man experienced in transparentizing paper. Ability to work with research chemists and design or assist in the design of equipment for transparentizing papers. Experiance more important than age. Give complete information in first letter, including salary requirements. All answers held confidential. Address IF-253, care Industrial Finishing.

### INDUSTRIAL SALESMAN

Wanted to call on established trade and develop new business for well-known aggressive eastern paint manufacturer. Prefer man familiar with New England territory who has called on woodworking and metal industries. Address IF-268, care Industrial Finishing.

### INDUSTRIAL AND TRADE SALESMEN

Wanted to represent a middle-west Paint and Coatings manufacturer for middle-west and eastern states. Must have following and experience. State full particulars in first letter. Commission basis only. Address IF-252, care Industrial Finishing.

### CHEMISTS WANTED.

Trained and experienced men wanted for Surface Coatings Group of the Technical Service and Development Division of the Stamford, Connecticut Laboratories of the American Cyanamid Company.

### STAIN FORMULATOR.

Well-known established manufacturer wants man to take full charge of stain production. Exceptional opportunity. Permanent. All correspondence confidential. Our employees are informed as to this advertisement. Address IF-240, care Industrial Finishing.

### CHEMISTS WANTED

For Protective Coatings, Formulation and Control. An opportunity to become associated with outstanding Laboratory personnel. The positions open are permanent and offer many advantages — educational, financial and recognition of merit. Apply STANDARD VARNISH WORKS, 2600 Richmond Terrace, Staten Island, N. Y.

### OPPORTUNITY EXISTS

In industrial laboratory for man experienced in applications of paints, varnishes and lacquers for exhibition and evaluation work. Preferably, his experience should be completely rounded, covering all types of industrial finishes. Emphasis will be laid on experience in wood finishing. In reply, state experience and salary expected. Location: Suburban New York. Address IF-250, care Industrial Finishing.

### EQUIPMENT WANTED.

Two 160-gal. Porcelain, one 160-gal. Steel ball Pebble Mills; two 500-gal. open-head lacquer mixing tanks wanted by mid-western paint and lacquer company. State full details and prices in first letter. Address IF-254, care Industrial Finishing.

### FORBES BAKING PRIMER

76—55-gal. drums Forbes Dark Grey Baking Primer @ 40c
In excellent condition. All or part. RAND CHEMICAL PRODUCTS CO., 2335 So. Mich. Ave., Chicago 16, Phone CALumet 2866-67.

### FOR SALE.

Eclipse Automatic Paint Spray Machine, 4-ft. turntable, 36 indexed stations, steam type unit heater with drying tunnel, equipped with exhaust fan and 220V, 60 cycle, 2 phase explosion proof motors. Indexes 900 to 1200 per hour. Complete with one 25 gallon pressure container, control head, air motored agitator, 5 guns and hose and conveyor. Contact J. A. Laws, ELECTRIC POWER EQUIPMENT CORPORATION, 412 North 18th Street, Philadelphia 30, Pa.

## EQUIPMENT FOR SALE

### DEGREASER

**Manufacturer** — Detroit Rex Products Company
**Type—Batch type**—Solvent Vapor Machine
**Max. Work Clear**—11'0" lg. x 3'0" wide x 4'6" high.
**Approx. Overall**—12'10" lg. x 4'9" wide x 9'0" high
**Solvent**—Perm-A-Clor or Triad
Machine equipped with pump and flexible hose for slushing operation. Water jacket condenser replaced with mechanical refrigeration, steam heated solvent boiler, complete with necessary controls.

### BONDERIZING

**Manufacturer**—Parker Rust Proof Co.
**Type**—Batch type
**Tank Size**—11'6" lg. x 3'2" wide x 68" deep—1320 ga. capacity.
Process consists of four steam heated tanks—No. 1, Hot Water Rinse at 212° F.; No. 2 Dip Spra Bonderite 180° F.; No. 3, Hot Water Rinse 180° F.; No. 4, Chromic Acid Rinse 210° F. Bonderite tank lined with stainless steel.

### SPRAY BOOTH

Water washed complete with pump, water filter, controls and centrifugal exhaust fan.
Approx. size of work area—16'0" lg. x 8'0" high x 7'0" deep.

### OVEN

Approx. Size—14'0" lg. x 12'0" wide x 7'8" high. Double doors, hinged, located at each end of the oven. Oven heated with a "Ross" single unit type F-10 650,000 BTU gas fired heater with a maximum air delivery temperature of 650° F. Oven complete with burner control, temperature control, safeties, air circulating and exhaust fans.

### AIR CONDITIONING FOR SPRAY ROOM

This equipment consists of a fan, oil bath filter, steam heated air heater and necessary distribution ducts.
Above equipment now in use and will be available sometime in March. Recommend you see it in use. Equipment in excellent condition being sold because of expansion program. All of the above equipment offered subject to prior sale and offered f.o.b. our plant with purchaser assuming all expenses of dismantling and hauling away. For complete information phone, write or visit plant.

Contact Frank May

**HUSSMANN-LIGONIER CO.**
**2401 North Leffingwell Avenue**
**ST. LOUIS, MO.**

## HOME for them!

## and the HOME STRETCH for YOU!

You still have time! In December, your employees' allotments to the Victory Loan through your company's Payroll Savings Plan offer you a final chance to help speed the homecoming of our fighting men—do all in medical power for our hospitalized heroes!

Make December a plantwide TOP-THE-QUOTA drive! Now's the time to "brief" your Bond-selling organization for fast, last minute action!

See that every employee is resolicited to buy the new Franklin Roosevelt Memorial $200 Bond! Better than cash in hand because it earns interest, this $200 Bond is a strong building stone toward the secure future of every employee-purchaser!

From now 'til the New Year—with plant rallies, interdepartmental contests and resolicitation—keep your Payroll Savings Plan at a new Victory Loan high! Buying a Victory Bond is the best way of saying "Welcome Home" to our returning veterans! Also an active aid in assuring prosperity to your nation, your employees —and your own industry!

*The Treasury Department acknowledges with appreciation the publication of this message by*

**INDUSTRIAL FINISHING**

*This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and War Advertising Council*

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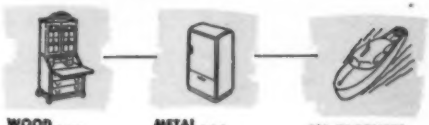
# IT'S THE *Finish* THAT SELLS!

***Finish*** **SELLS MANY PRODUCTS**



WOOD . . . METAL . . . ALL PRODUCTS

**Automobile manufacturers know the value of a good finish. A shiny, beautiful finish gives added eye appeal . . .** ***it will help sell your product too!***

**The Sterling Portable Electric Sander will produce a perfect, uniform surface . . . economically . . . in less than one-third the time required by hand. Simple to operate, vibrationless, light weight. Sands (course or fine), laps, polishes.**

**Ask your distributor for a demonstration or write:**
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**365 E. OHIO ST., CHICAGO 11, ILLINOIS.**

***For extreme wet sanding (water or volatile liquids), ask about the Sterling Speed-Bloc Air-Driven Sander.***

***For production, maintenance and refinishing.***

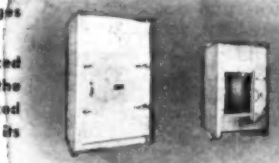
**STERLING PORTA 1000 TRIC SANDER**

Remarkable developments have been made in finishing operations during recent years. New techniques have substantially reduced drying time and lowered costs, as well as improving the quality of the finish.

To keep ahead in the greatly stepped-up race of competition, you will need these superior oven advantages in your business.

Our staff of experienced oven engineers, with the entire fund of advanced finishing techniques at its disposal, selects those methods which are best suited for the individual job. They then plan, design, and install a "custom built" oven guaranteed to provide maximum speed and quality in product finishing at minimum cost.

Names of nationally known industrial plants using Kirk & Blum drying, baking, and laboratory ovens, as well as additional information about our services, will be gladly supplied on request.



The KIRK & BLUM Manufacturing Co.

2898 SPRING GROVE AVENUE CINCINNATI 25, OHIO